Parenting Behaviors, Perceived Competence, and Exercise of Girls In Middle Childhood

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Parental socialization patterns (permissiveness, authoritarianism, authoritativeness), parental exercise, and perceived competence influence children’s vigorous physical activity according to sport socialization theory. In this study of 155 healthy public school fifth-grade (51%) and sixth-grade (49%) girls and their parents, the parents were primarily Caucasian (60.4%), high school or college educated (88.9%), employed in professional, managerial, or technical support occupations (63%), and in good health (90.6%).

Correlation, regression, and analysis of variance statistics revealed that girls' perceived athletic competence was significantly and positively related to girls' exercise (r = .27, p = .001); that girls' exercise and (a) perceived cognitive competence (r = .03, p = .69) and (b) perceived global self-worth (r = .14, p = .08) were not significantly correlated; that a one-variable model explained 8% of the variance in girls' exercise [F(3, 151) = 4.33, p = .006]; that girls' exercise and perceived social competence were positively and significantly related (r = .22, p = .007); and that girls' exercise and paternal and maternal psychological autonomy-granting were significantly and negatively related (r = -.23, p = .004; r = -.17, p = .03 respectively). Girls' exercise did not differ by perceived paternal or maternal socialization pattern [F(2.67) = 1.75, p = .18; F(2.65) = .73, p = .49 respectively]. Girls' exercise was not related to paternal moderate exercise (r = .06, p = .51), paternal vigorous exercise (r = .10, p = .26), maternal moderate exercise (r = -.07, p = .42), or maternal vigorous exercise (r = .08, p = .34).
Perceived athletic competence, perceived social competence and perceived parental psychological autonomy-granting were related to girls’ exercise, and athletic competence perceptions explained a small amount of the exercise variance for girls. Despite theory, three parental socialization patterns and parental exercise were not related to fifth- and sixth-grade girls’ exercise. It can be concluded that selected propositions of the theory may have meaningful application for improving girls’ exercise habits, that selected propositions of the sport socialization theory may not apply to girls, and that the relationships between parental behaviors and girls’ exercise need further exploration.
Preface

The process of conducting this research has been interesting and enlightening. Such an endeavor cannot be successfully concluded entirely on one's own. Many people have contributed to the completion of this project and my gratitude goes out to each of them.

I have benefitted mightily from the opportunity to work under the guidance of Dr. Nancy S. Redeker in developing my nascent skills as a nurse scientist. The other members of my dissertation committee have each provided me with precious opportunities for learning and growth. I extend my thanks to Dr. Adela Yarcheski, Dr. Mary Ann Scoloveno, and Dr. Stephen Hansell.

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Families and friends inevitably bear with much during an effort of such intensity and length as this. Mine are no exception and I am deeply grateful for the support of them all, particularly that from my husband Ed, my children Michael and Julie, my parents Ray and Kathleen, and my dear friend Barbara.
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CHAPTER I

The Problem

One-quarter of a million Americans die annually from diseases in which a sedentary lifestyle plays a part, and efforts to increase adult Americans’ participation in exercise have had little effect (U.S. Department of Health and Human Services, 1996). Health habits, including the habit of regular exercise, are formed in childhood (Bandura, 1997; Brustad, 1991; Flaherty, 1986; Hester, 1987; Pender, 1975; Reynolds et al., 1990; Stucky-Ropp & DiLorenzo, 1993; U.S. Department of Health and Human Services, 1996). Girls are particularly at risk for inadequate exercise. Although there are only small, insignificant physiological differences between girls and boys before puberty, and girls demonstrate increases in strength, power and endurance through childhood until puberty (Rowland, 1990), pre-adolescent girls are consistently found to be less physically active than boys (Harrell, Gansky, Bradley, & McMurray, 1997; Myers, Strikmiller, Webber, & Berenson, 1996; Rowland, 1990). Efforts to modify those factors associated with exercise participation in childhood may contribute to improvement in lifelong exercise habits (Rowland & Freedson, 1994; Sallis et al., 1992; Simons-Morton et al., 1990).

The authors of the sport socialization theory (Kenyon & McPherson, 1973) proposed that exercise is a learned social role acquired primarily after early childhood. In the sport socialization theory, perceived competence in the exercise role, parental socialization patterns (permissiveness, authoritarianism, authoritativeness), and parental exercise behavior are contributors to individual child involvement in all kinds of vigorous physical activities (Kenyon & McPherson, 1973).

Perceived competence is the self-awareness of the ability to have some effect in one’s environment (White, 1960). For children over the age of eight years, perceived competence has four domains: perceived cognitive competence, perceived social competence, perceived athletic
competence, and perceived global self-worth (Harter, 1982, 1983). Positive relationships have been found for children between perceived competence and some aspects of physical activity involvement. However, research findings in this area are conflicting and studies have included both school-age and adolescent boys and girls (Brustad, 1993; Ferguson, Yesalis, Pomrehn, & Kirkpatrick, 1989; Klint & Weiss, 1987; Roberts, Kleiber, & Duda, 1981; Williams & Gill, 1995).

Parents are important exercise role socialization agents (Greendorfer, 1983; Kenyon & McPherson, 1973), particularly prior to adolescence (Greendorfer & Lewko, 1978; Higginson, 1985; Weiss & Knoppers, 1982). but girls and boys are socialized differently (Greendorfer & Ewing, 1981; Weitz, 1977). Sports and other vigorous activities using large spaces are characterized as masculine in American culture (Kenyon & McPherson, 1973; The President's Council on Physical Fitness and Sports, 1997), where boys are socialized to independence and individuation and girls are socialized in a manner emphasizing interpersonal relationships and dependence (Chodorow, 1974). Girls may be overtly discouraged from vigorous physical activity or simply not receive encouragement to develop the skills necessary to be confident in physical activity (Gill, 1995; Greendorfer, 1983; The President's Council on Physical Fitness and Sports, 1997). Furthermore, in American culture, the traditional maternal role emphasizes expressive functions while the traditional paternal role emphasizes instrumental functions (Parsons & Bales, 1955). Maternal and paternal socialization efforts may differ as a consequence of differences in parents' childhood socialization experiences and culturally supported role differences. It is, therefore, important that parental socialization of girls for exercise be studied separately from socialization of boys.

Parents socialize children through parental behaviors such as acceptance, psychological autonomy-granting, and direction-supervision which combine to form authoritative.
authoritarian, and permissive parental behavior patterns (Baumrind, 1966, 1971; Schaefer, 1959, 1965b). Perceived parental behavior patterns are related to children's responsibility and leadership behaviors (Baumrind, 1967, 1971; Baumrind & Black, 1967; Bronfenbrenner, 1961), achievement behaviors (Baumrind, 1967, 1971), and school-related behaviors (Steinberg, Elmen, & Mounts, 1989; Steinberg, Lamborn, Dornbusch, & Darling, 1992). The extent to which perceived parental behavior patterns are related to children's health-related behaviors, such as exercise, is unknown.

Parental socialization has been positively correlated with children's physical activity in some studies (Butcher, 1983; Greendorfer & Lewko, 1978; Snyder & Spreitzer, 1976). However, these studies have been limited by single item measures of parent socialization (Butcher, 1983; Greendorfer & Lewko, 1978; Snyder & Spreitzer, 1976) and athletic ability (Snyder & Spreitzer, 1976), and studies have included both girls and boys (Greendorfer and Lewko, 1978) and children of various age groups (Butcher, 1983; Snyder & Spreitzer, 1976). There is a need to further examine the relationships between parental socialization behaviors and exercise in preadolescent girls.

Theoretically, parents who exercise will have children who exercise (Kenyon & McPherson, 1973). Investigators have demonstrated that exercise patterns are similar for parents and their children: very active parents tend to have more active children than do sedentary parents (DiLorenzo, Stucky-Ropp, Vander Wal, & Gotham, 1998; Freedson & Evenson, 1991; Gottlieb & Chen, 1985; Moore et al., 1991; Perusse, Tremblay, LeBlanc, & Bouchard, 1989; Rossow & Rise, 1994; Sallis, Patterson, Buono, Atkins, & Nader, 1988; Sallis, Patterson, McKenzie, & Nader, 1988; Stucky-Ropp & DiLorenzo, 1993). Subjects who report having parental exercise models are found to be more inclined to exercise themselves (Reynolds et al., 1990; Sallis et al., 1989). Previous studies used samples of both boys and girls (DiLorenzo et
al., 1998; Freedson & Evenson, 1991; Gottlieb & Chen, 1985; Moore et al., 1991; Perusse, Tremblay, LeBlanc, & Bouchard, 1989; Reynolds et al., 1990; Rossow & Rise, 1994; Sallis, Patterson, Buono et al., 1988; Sallis, Patterson, McKenzie et al., 1988; Stucky-Ropp & Dilorenzo, 1993). Some studies included samples with younger children (Freedson & Evenson, 1991; Moore et al., 1991; Sallis, Patterson, McKenzie, et al., 1988), or adolescents only (Gottlieb & Chen, 1985; Perusse et al., 1989; Reynolds et al., 1990; Rossow & Rise, 1994), or both pre-adolescents and adolescents (Dilorenzo et al., 1998). No study has examined the relationship of parental exercise to exercise behavior in a sample of pre-adolescent girls alone.

Statement of the Problem

1. What is the relationship between pre-adolescent girls’ perceived competence and self-reported exercise behavior?

Sub-problems

1a. What is the relationship between perceived athletic competence and self-reported exercise behavior?

1b. What is the relationship between perceived social competence and self-reported exercise behavior?

1c. What is the relationship between perceived cognitive competence and self-reported exercise behavior?

1d. What is the relationship between perceived global self-worth and self-reported exercise behavior?

2. Are there differences in the self-reported exercise behavior of pre-adolescent girls who perceive permissive, authoritative, or authoritarian parental behavior patterns?

Sub-problems

2a. Are there differences in girls’ exercise behavior when they perceive paternal
behavior to be permissive, authoritative or authoritarian?

2b. Are there differences in girls’ exercise behavior when they perceive maternal behavior to be permissive, authoritative or authoritarian?

3. What is the relationship between parental self-reported exercise and pre-adolescent girls’ self-reported exercise behavior?

Sub-problems

3a. What is the relationship between paternal self-reported exercise and girls’ self-reported exercise behavior?

3b. What is the relationship between maternal self-reported exercise and girls’ self-reported exercise behavior?

Definition of Terms

Exercise Behavior

Exercise behavior of children is defined as regular physical activity involving dynamic and rhythmic movement which produces sufficient demand to lead to physical fitness (Haskell, Montoye, & Orenstein, 1985; Rowland, 1990). Exercise is a multidimensional experience for children and includes play, competition, exertion, social interaction, and development of skills (Brustad, 1993). Exercise behavior of girls will be operationalized as the average exercise intensity score for the daily self-report of exercise over one week on the Child/Adolescent Activity Log (CAAL). Average exercise intensity is calculated from the number of activities reported, the duration of each activity, and an energy cost factor for each type of activity (Garcia, George, Coviaik, Antonakos, & Pender, 1997).

Perceived Competence

Perceived competence is the subjective reality of ability to be effective in the environment that results from the accumulated outcomes of one’s transactions in one’s
Perceived competence has a four-domain structure for children over the age of eight years [perceived athletic competence, perceived social competence, perceived cognitive competence, perceived global self-worth] (Harter, 1978, 1982). Perceived competence will be operationalized by the four sub-scale scores [perceived athletic competence, perceived social acceptance, perceived scholastic competence, perceived global self-worth] of the Self-Perception Profile for Children (SPPC) (Harter, 1985).

**Perceived athletic competence.** Perceived athletic competence is the subjective reality of one's athletic ability (Harter, 1978, 1985). Perceived athletic competence will be operationalized by the athletic competence sub-scale score of the SPPC (Harter, 1985).

**Perceived social competence.** Perceived social competence is the subjective reality of social acceptance by peers (Harter, 1978, 1985). Perceived social competence will be operationalized by the social acceptance sub-scale score of the SPPC (Harter, 1985).

**Perceived cognitive competence.** Perceived cognitive competence is the subjective reality of one's scholastic performance (Harter, 1978, 1985). Perceived cognitive competence will be operationalized by the scholastic competence sub-scale score of the SPPC (Harter, 1985).

**Perceived global self-worth.** Perceived global self-worth is the degree to which one likes oneself and is happy with one's life, not tied to specific competency domains (Harter, 1978, 1985). Perceived global self-worth will be operationalized by the global self-worth sub-scale scores of the SPPC (Harter, 1985).

**Perceived Parental Behavior Patterns**

Perceived parental behavior patterns can be classified into three types: authoritarian, authoritative, and permissive. Each of these patterns involves different degrees of three parental behaviors of acceptance, psychological autonomy-granting, and direction-supervision (Baumrind, 1966, 1971) and are operationalized as the acceptance, psychological autonomy-granting and
direction-supervision scores on the 56-item version of the Child Report of Parent Behavior Inventory (CRPBI) (Margolies & Weintraub, 1977) developed by Schaefer (1965 a, b).

Perceived parental acceptance behavior is action by which the child perceives the parent as loving, responsive, involved, encouraging, and emotionally supportive (Schaefer, 1959, 1965b). Perceived parental psychological autonomy-granting behavior is action by which the child perceives the parent to be noncoercive, democratic, and encouraging of individuality (Schaefer, 1959, 1965b). Perceived parental direction-supervision behavior is action by which the child perceives the parent to exert firm control, monitoring the child’s behavior, and setting limits (Schaefer, 1959, 1965b).

**Authoritarian parental behavior pattern.** The authoritarian parental behavior pattern exhibits direction-supervision parental behavior above the median, and acceptance and psychological autonomy-granting parental behaviors below the median (Baumrind, 1971). Authoritarian maternal and paternal behavior each will be operationalized as a score above the median on firm control combined with scores below the median on both acceptance and psychological autonomy for each parent on the 56-item version (Margolies & Weintraub, 1977) of the CRPBI (Schaefer, 1965 a, b). Therefore, variables will include perceived maternal authoritarian behavior pattern and perceived paternal authoritarian behavior pattern.

**Authoritative parental behavior pattern.** The authoritative parental behavior pattern exhibits direction-supervision, acceptance, and psychological autonomy-granting parental behaviors above the median (Baumrind, 1971). Authoritative maternal and paternal behavior each will be operationalized as combined scores at or above the median on firm control, acceptance, and psychological autonomy for each parent on the 56-item version (Margolies & Weintraub, 1977) of the CRPBI (Schaefer, 1965 a, b). Therefore, variables will include perceived maternal authoritative behavior pattern and perceived paternal authoritative behavior pattern.
pattern.

**Permissive parental behavior pattern.** The permissive parental behavior pattern exhibits direction-supervision parental behavior below the median, and acceptance and psychological autonomy-granting parental behaviors above the median (Baumrind, 1971). Permissive maternal and paternal behavior each will be operationalized as a score below the median on firm control combined with scores above the median on acceptance and psychological autonomy for each parent on the 56-item version (Margolies & Weintraub, 1977) of the CRPBI (Schaefer, 1965 a, b). Therefore, variables will include perceived maternal permissive behavior pattern and perceived paternal permissive behavior pattern.

**Parental exercise**

Parental exercise is defined as the parents' participation in regular vigorous physical activity involving dynamic and rhythmic movement which produces sufficient demand to lead to physical fitness (Haskell et al., 1985; Kenyon & McPherson, 1973). Parental exercise will be operationalized as maternal and paternal self-reported vigorous physical activity scores (Sallis et al., 1985). The vigorous physical activity score is derived from the reported number of activities which occur at a specified frequency and duration, and which therefore require a specified energy expenditure. Therefore, variables will include maternal exercise and paternal exercise.

**Pre-adolescence**

Pre-adolescence is defined as the developmental period of late childhood which begins at age nine years and ends at the twelfth birthday (Murray & Zentner, 1997).

**Delimitations**

The sample of girls will be delimited to girls in fifth and sixth grade in northern New Jersey, ages 9 to 11 years, who live with two parents so that they will be able to report perceptions of both mother and father. Eligible subjects will read and understand English and be
attending regular public elementary school classes to assure an adequate ability to consent to participation and to comprehend and follow directions for data collection. Subjects will have no prescribed or disability-related limitations on physical activity to avoid confounding the reporting of exercise behavior. Subjects will consent to participate and have parental consent for participation in the study. Parents who consent to the participation of their daughter will be asked to provide anonymous data concerning their own exercise.

With regard to exercise, pre-adolescence is a period of peaks preceding decline. Girls experience steady increases in strength, power, and endurance until a peak at around 12 years of age, followed by a decline in adolescence and adulthood (Rowland, 1990). A decrease in perceived competence also occurs at around age 12, when children are in seventh grade (Harter, 1982, 1985). Exercise role learning primarily occurs after early childhood (Kenyon & McPherson, 1973) and parents are more important exercise role socialization agents prior to adolescence than during or after adolescence (Greendorfer, 1983; Greendorfer & Lewko, 1978; Higginson, 1985; Kenyon & McPherson, 1973; Weiss & Knoppers, 1982).

**Significance**

The health habit of exercise is formed early in life (Bandura, 1997; Brustad, 1991; Flaherty, 1986; Hester, 1987; Pender, 1975; Reynolds et al., 1990; U.S. Department of Health and Human Services, 1996), and regular physical activity enhances health in childhood (Sallis, McKenzie, & Alcaraz, 1993). Regular exercise is positively related to self-esteem, body image, and mood states (The President’s Council on Physical Fitness and Sports, 1997). Greater exercise participation of children is positively associated with the body fatness, lipid, and insulin function profiles linked with lower risk of cardiovascular disease and diabetes mellitus (Gutin et al., 1994; Purath. Lansinger, & Ragheb, 1995; Suter & Hawes, 1993; Taylor & Baranowski, 1992).
Even though girls' motor skills, strength, power, and endurance show the same pattern of improvement that boys' do (Harrell et al., 1997; Myers et al., 1996; Riddoch, Savage, Murphy, Cran. & Boreham, 1991; Rowland, 1990), girls are less active than boys at every stage of childhood, which puts girls especially at risk for developing poor exercise habits which may persist into adulthood.

The sport socialization model suggests that perceived competence, perceived parental behaviors, and parental exercise each influence children's exercise (Kenyon & McPherson, 1973), but there has been little testing of these relationships among girls. Children exhibit a decrease in perceived competence in later childhood, around the time they are in seventh grade (Harter, 1982, 1985), and girls often report lower perceived competence than boys (Brustad, 1993; Eccles, Wigfield, Harold, & Blumenfeld, 1993; The President's Council on Physical Fitness and Sports, 1997; Williams & Gill, 1995). The relationship of perceived competence to exercise may not be the same for girls as for boys and so should be investigated separately.

Socialization of girls differs from that of boys (Greendorfer & Ewing, 1981; Weitz, 1977). The paternal role emphasizes instrumentality, and boys are encouraged to focus on individuality and independence, while the maternal role emphasizes expressiveness, and girls are encouraged to focus on interpersonal relationships and dependency (Chodorow, 1974; Parsons & Bales, 1955). Girls may be discouraged from vigorous physical activity because it carries a masculine connotation (Gill, 1995; Greendorfer, 1983; The President's Council on Physical Fitness and Sports, 1997). However, parents' exercise has been found to be related to exercise of girls and boys (DiLorenzo et al., 1998; Freedson & Evenson, 1991; Gottlieb & Chen, 1985; Moore et al., 1991; Perusse et al., 1989; Rossow & Rise, 1994; Sallis, Patterson, Buono et al., 1988; Sallis, Patterson, McKenzie et al., 1988; Stucky-Ropp & DiLorenzo, 1993).

Because socialization appears to differ for girls compared to boys, the proposed relationships
between parental behaviors and exercise behaviors should be investigated separately for girls.

Primary prevention ideally involves intervention to change psychological and social factors that influence important health behaviors such as exercise (Perry, Klepp, & Shultz, 1988). Nurses need to identify and study human behaviors that affect health (Rogers, 1990) so that nursing interventions with the goal of primary prevention in important health areas can be designed to be more effective. Clarification of the relationships between perceived competence and certain parental behaviors and pre-adolescent girls' exercise may lead to further research into ways to enhance exercise participation by girls. If the hypothesized relationships between parental behaviors and girls' exercise are supported, parents and their daughters may benefit from interventions to change exercise behavior. The present study will add to nursing's body of knowledge surrounding exercise behavior of girls at a time when there is national concern about the level of regular physical activity among all Americans and its impact on their health (U.S. Department of Health and Human Services, 1996).
CHAPTER II

Review of the Literature

The review of the literature presents theory and empirical studies linking the dependent variable of exercise behavior with the independent variables of perceived competence, perceived parental behavior patterns, and parental exercise. The nature of children's exercise and descriptive studies of girls' exercise; the sport socialization theory; and theory and empirical research linking perceived competence, parental behavior patterns, and parental exercise with children's exercise are discussed. Finally, the theoretical rationale for the study and the hypotheses and research questions are presented.

Theories of Exercise Behavior

Exercise behavior is regular physical activity involving dynamic and rhythmic movement which produces sufficient physiological demand to lead to positive changes in physical fitness, such as increased motor proficiency, aerobic capacity, strength, and flexibility (Blair et al., 1989; Haskell et al., 1985; Rowland, 1990; The President's Council on Physical Fitness and Sports, 1997). Exercise can occur in highly structured and supervised programs where activity is observed and directed, or more spontaneously in unstructured and unsupervised recreational activities (Dishman, Sallis, & Orenstein, 1985). It may be a team endeavor or done completely alone (Kenyon & McPherson, 1973).

Exercise is associated with recognized physiological and psychological health benefits in both adults and children, such as improvements in lean body mass, lipid and insulin function, self-esteem, body image, and mood states (Gutin et al., 1994; Purath et al., 1995; Sallis et al., 1993; Suter & Hawes, 1993; Taylor & Baranowski, 1991; The President's Council on Physical Fitness and Sports, 1997). The health benefits of exercise are a function of the frequency and duration and intensity of exercise. Exercise which occurs at least three times per week, for at
least 20 to 30 minutes each time, at 60% or more of the individual’s aerobic capacity, and requiring an energy expenditure of more than three kilocalories per kilogram of body weight per day produces a beneficial health effect (Haskell et al., 1985; Sallis, Haskell, Wood, Fortmann, & Vranizan, 1986; Sallis et al., 1989; Stephens, Jacobs, & White, 1985). A variety of physical activities that involve dynamic large muscle movement, stretching for flexibility, and resistance for muscle strengthening produce the best overall health benefits from exercise (Haskell et al., 1985).

Children’s exercise is a multidimensional experience which includes exertion, play, and social interaction, as well as the skill development and competition generally associated with sport participation (Brustad, 1993). Through exercise, children learn to control their bodies in space, perfecting movement patterns involving gross motor skills, and acquiring skills useful in daily living, work, and recreation throughout life (Greendorfer, 1983; The President’s Council on Physical Fitness and Sports, 1997). The sport socialization theory is a general theory for socialization into physical activity roles, since sport encompasses many kinds of physical activity, including exercise, games, contests, and expressive activity (Kenyon & McPherson, 1973).

**Descriptive Studies of Exercise in Girls**

Pre-adolescent girls report enjoying a wide variety of physical activities. The National Children and Youth Fitness Study II (NCYFS II) found that the most frequently performed physical activities of children in a nationally representative sample of 4,678 six- to nine-year-olds included many of the same activities for both boys and girls: swimming, running, bicycling, soccer, playing on a playground, walking and hiking, basketball, and climbing. However, girls were more likely than boys to engage in gymnastics and dance, roller skating, and jumping rope (Ross & Pate, 1987). Myers et al. (1996) also found that, among a sample of 995 nine- to
fifteen-year-old boys and girls, girls reported engaging in a wide variety of physical activities, including walking, running, calisthenics, biking, dance, gymnastics, jump rope, outdoor play, games, basketball, ball playing, baseball, volley ball, racket sports, and football. Harrell et al. (1997) asked a sample of 2200 healthy boys and girls ages 7 to 12 years to select their three most common activities from a list of 25 options. Girls reported that they biked, danced, ran, roller skated, and played basketball, baseball, soccer, and football (Harrell et al., 1997). Ignico (1990), using a sample of 119 children ages 7 to 13, found that elementary school-age girls preferred a wider range of activities than boys did, including team sports which are often stereotyped as male activities.

Although girls report a variety of physical activities, girls do not participate frequently in vigorous physical activities. In the NYCFS II, swimming was the most commonly reported activity but by only 39% of the girl respondents (Ross & Pate, 1987). Fifteen per cent or fewer of girls reported other activities such as bicycling, walking, jumping rope, or team sports (Ross & Pate, 1987). Homework and television watching were the most commonly reported activities (38.9% and 30.4% respectively) of 1,115 girl respondents (Harrell et al., 1997). Of the most frequent vigorous activities, only bicycling (30.9%) was reported at a similar rate (Harrell et al., 1997). In contrast, Myers et al. (1996) found that most of their 522 girl participants in grades five through eight reported walking (84%) and running (54%). However, the duration of daily vigorous physical activity (110 minutes) was lower than sedentary activity (160 minutes) for girls in the sample (Myers et al., 1996). While girls may engage in a wide variety of physical activities, the frequency of vigorous exercise is low.

**The Sport Socialization Theory**

The sport socialization theory (Kenyon & McPherson, 1973) takes a social learning perspective, and the authors conceptualize exercise as a learned social role. A role is a typified.
prescribed behavior pattern supported by social norms and expectations (Loy & Ingham, 1973). The role aspirant possesses various personal physical and psychological characteristics, such as knowledge, skill, and interest relevant to the behaviors of a given role; and is socialized through systematic rewards and punishments from significant others related to role behaviors and through observing others in the desired role (Kenyon & McPherson, 1973).

Kenyon and McPherson (1973) proposed that three categories of variables would be directly related to exercise participation: personal attributes, significant others, and social situations. Personal attributes include variables such as perceived competence in exercise behaviors, age, and gender (Kenyon & McPherson, 1973). Kenyon and McPherson (1973) proposed that greater competence in exercise leads to greater participation in exercise. This study will focus on examining the personal attribute of perceived competence in relation to exercise behavior.

In the sport socialization theory, significant others are socializers of exercise behavior and include parents, siblings, peers, teachers, and coaches (Kenyon & McPherson, 1973). Before adolescence, family members are more important socializers into physical activity than peers, teachers, or coaches (Kenyon & McPherson, 1973). Empirical studies have identified parents as the most important familial socializing influence for exercise prior to adolescence (Greendorfer & Lewko, 1978; Higginson, 1985; Weiss & Knoppers, 1982). Authoritarian, authoritative, and permissive parental behavior patterns are linked with exercise by the sport socialization theory (Kenyon & McPherson, 1973). Parents who are more permissive have the greatest influence over their children regarding exercise, and therefore the children's participation in exercise will be greatest. Parents who are authoritative with their children are more effective socializers of exercise behavior than authoritarian parents. When parents are authoritarian, their children's exercise participation is lowest. When there are more positive
sanctions and fewer negative sanctions throughout the child’s experiences, exercise increases (Kenyon & McPherson, 1973).

Social learning theory, the perspective from which the sport socialization theory was developed, suggests that socialization can occur through exposure to the activities of significant others (Bandura, 1977, 1997). Kenyon & McPherson (1973) propose that parental participation in exercise increases children’s participation in exercise.

Kenyon and McPherson (1973) proposed that internal personal characteristics and external influence of others are related to exercise behavior. This study will examine the variables of perceived competence, perceived permissive parental behavior pattern, perceived authoritarian parental behavior pattern, perceived authoritative parental behavior pattern, parental exercise and the exercise behavior of pre-adolescent girls.

Theories of Perceived Competence

Perception of competence in exercise is related to exercise behavior (Kenyon & McPherson, 1973). Perceived competence is the subjective reality of the ability to be effective in the environment and results from the accumulated outcomes of one’s transactions with the environment (White, 1960). Demonstrating competence is a pleasurable and satisfying experience (White, 1959). According to Erikson (1968), success and failure in demonstrating one’s skills is the central crisis of psychological development in pre-adolescence. The child is especially eager at this time to win recognition for skill attainment, and perceived competence is the positive resolution of this period of development (Erikson, 1968).

During childhood, perceived competence is organized and differentiated according to kinds of activity (White, 1963). Children’s competence has four areas: cognitive competence, athletic competence, social competence, and general self-worth (Harter, 1978). These types of competence are present in children’s judgments about themselves as early as eight years of age.
(Harter, 1982, 1983). Harter (1978) proposed that children perceive themselves as more
cOMPETENT in some areas than in others, and so children's perceived competence must be
considered across the categories rather than looking at a singular entity (Harter, 1978, 1985,
personal communication, February 18, 1998). Perceptions of competence in each domain are
expected to have different relationships to various kinds of children's behaviors (Harter, 1978).

Occupying any role implies that one has certain knowledge and skills relevant to that role
(Kenyon & McPherson, 1973). The role aspirant's perception of competence in the required
knowledge and skills is likely to influence continued efforts to attain the desired role and to
demonstrate the role behaviors. In the sport socialization theory, Kenyon & McPherson (1973)
proposed that greater perceived competence in exercise leads to greater exercise participation. In
his psychosocial development theory, Erikson (1968) suggested that perceived competence might
explain decisions to engage in exercise behaviors for pre-adolescent children, while Harter
(1978) suggested that each type of perceived competence will be differently related to exercise
behavior in competence motivation theory.

Empirical Studies of Perceived Competence and Exercise Behavior

The personal characteristic which impels an individual to achievement-oriented
behaviors has been labeled perceived competence or perceived ability in the literature (Roberts et
al., 1981). Perceived competence or ability of children has been positively linked with sports
participation (Roberts et al., 1981; Snyder & Spreitzer, 1976), with attraction to physical activity
(Brustad, 1993), and with current as well as intended exercise (Ferguson et al., 1989).

In a study demonstrating differences in perceived competence between sports
participants and non-participants (Roberts et al., 1981), 70 girls and 73 boys (aged 9 to 11 years)
in the fourth and fifth grades participated in structured interviews and completed The Perceived
Competence Scale for Children (PCSC) (Harter, 1982). On the basis of interview data, each

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child was classified as a participant or non-participant in organized sports (Roberts et al., 1981).

Girls and boys who participated in organized sports had greater perceived competence than non-participants in three of four competence realms. Perceived cognitive competence \[ F(1, 520) = 4.20, \ p < .05 \], perceived athletic competence \[ F(1, 520) = 4.43, \ p < .05 \], and perceived global self-worth \[ F(1, 520) = 5.14, \ p < .05 \] scores were significantly higher for children who played organized sports than for those who did not. Perceived social competence was not significantly different between the participant and non-participant groups (Roberts et al., 1981).

Roberts et al. (1981) then proposed that duration of sport participation was likely to improve perceptions of competence and would account for the observed group differences. However, the duration of sport participation was not significantly correlated with any of the four kinds of perceived competence in girls (n = 69) or boys (n = 62). The investigators suggested that the absence of a relationship between perceived competence and duration of sport participation when differences in perceived competence were found between sport participants and non-participants may be due to self-selection, that is, children with high perceived competence choose to participate in sport because of higher perceived competence. Therefore, the researchers suggested that children with low scores on perceived competence would be expected not to participate in sports (Roberts et al., 1981).

Perceived athletic ability was positively related to both current exercise \( (r = .25, \ p < .01) \) and intent to exercise \( (r = .27, \ p < .01) \) in a sample of 603 sixth- through eighth-grade boys and girls (Ferguson et al., 1989). The independent variables of perceived athletic ability, perceived benefits of exercise, self-esteem, outside sports activities, attitudes about physical education, perceived ability to keep commitments, knowledge about exercise, and gender were examined in relation to the dependent variables of current exercise behavior and intent to exercise. Perceived
athletic ability did not enter either forward stepwise multiple regression equation with the dependent variables, current exercise and intent to exercise at the stipulated significance level of .05, and so did not explain either intended or current exercise (Ferguson et al., 1989). Current exercise was measured by a single questionnaire item concerning the frequency of exercise outside of physical education classes. Intent to exercise was also measured by a single question about future exercise plans. The three perceived athletic ability questions were developed by the investigators, and the composite score based on these three items produced an alpha of .74 (Ferguson et al., 1989).

Perceived competence has a positive relationship to children's attraction to physical activity in a study of 81 fourth-grade boys and girls and their parents who were part of an ongoing study of children's physical fitness (Brustad, 1993). Brustad (1993) examined the relationship of the independent variables perceived competence, parental encouragement, parental enjoyment of physical activity, parental fitness, and parental perception of the importance of physical activity on children's attraction to exercise (Brustad, 1993).

The dependent variable in this study, attraction to physical activity, was measured by a new scale, Children's Attraction to Physical Activity (CAPA), which consists of 22 items loading on five factors. Vigorous Exercise, Liking Games and Sports, Importance of Exercise, Peer Acceptance in Games and Sports, and Fun of Physical Exertion (Brustad, 1993). Internal consistency reliability coefficients for the five factor sub-scales ranged from .62 to .78 (Brustad, 1993). The independent variable of perceived competence was measured by the perceived athletic competence sub-scale of PCSC (Harter, 1982). The alpha reliability coefficient of the perceived athletic competence sub-scale was .78 for this sample (Brustad, 1993).

Path analysis was used to test a model with four sets of variables in the sample as a whole. Child's perceived athletic competence was the third step in the model, with parental
encouragement, parental enjoyment of physical activity, parental fitness, parental perception of
the importance of physical activity and child's gender in the first two steps (Brustad, 1993). The
final step in the path analysis tested the relationships between perceived athletic competence and
the five CAPA subscales. Perceived athletic competence explained 18.5% of the variance in
Vigorous Exercise ($\beta = .51$), 16.8% of the variance in Liking Games and Sports ($\beta = .57$), 13.7%
of the variance in Importance of Exercise ($\beta = .37$), 46.2% of the variance in Peer Acceptance
in Games and Sports ($\beta = .61$), and 41% of the variance in Fun of Physical Exertion ($\beta = .53$)
(Brustad, 1993). The findings demonstrated strong support for a relationship between perceived
athletic competence and attraction to physical activity.

The sport socialization theory has not been applied in studies of pre-adolescent
children's perceived competence and exercise. However, additional support for the proposed
relationships between perceived competence and exercise is found in a study of adolescent girls
(Snyder & Spreitzer, 1976). Snyder and Spreitzer (1976) recruited three samples of female high
school junior and senior athletes in Ohio, and they were asked to recruit girl friends who were
not participating in an organized athletic program. A total of 322 athletes and 234 non-athletes
participated in the study. Self-reported athletic ability, which was measured by a single item
rated on a six-point scale, was measured in the athlete and non-athlete groups.

Only 21% of the non-athletes perceived high athletic ability in themselves, while in the
athlete groups, 62% to 77% rated their athletic ability as high (Snyder & Spreitzer, 1976). No
statistical tests for athlete and non-athlete group differences in perceived athletic ability were
reported, and so one cannot determine if there is a statistically significant difference in perceived
athletic ability between athletes and non-athletes among adolescent girls.

In summary, the three studies of elementary schoolchildren (Brustad, 1993; Ferguson et
al., 1989; Roberts et al., 1981) and the study of adolescent girls (Snyder & Spreitzer, 1976)
examined perceived competence or perceived athletic ability and exercise behaviors, sports participation, or attraction to exercise. High competence perceptions were found among sports participants (Roberts et al., 1981; Snyder & Spreitzer, 1976). Perceived athletic ability was positively related to attraction to exercise, intended exercise, and current exercise (Brustad, 1993; Ferguson et al., 1989). Samples in each study of elementary school children included both males and females, and statistical analyses were performed on the samples as a whole, leaving open to question whether the results hold for both boys and girls. The present study will determine whether relationships between perceived competence and exercise behaviors hold when only data from girls are examined.

These studies of perceived competence and exercise in children also have some measurement issues. The instrument developed by Brustad (1993) had some subscale internal consistency reliabilities which were less than .70, a commonly accepted level for adequate reliability (Polit & Hungler, 1995). Current exercise and intent to exercise (Ferguson et al., 1989) and perceived athletic ability (Snyder & Spreitzer, 1976) were measured by single items, which have limited reliability and validity (Polit & Hungler, 1995). In the study of adolescent girls (Snyder & Spreitzer, 1976), school sports team membership was assumed to indicate higher level of physical activity than non-participation on a school team and thus to account for the different reports of perceived athletic ability in the two groups. Since level of physical activity was not measured specifically, it cannot be known if the level of physical activity actually differed between the athletes (sports team members) and non-athletes (non-members).

Although the results of the studies reviewed here suggest that perceived competence is related to physical activity, the use of samples including both boys and girls obscures the relevance of the findings for girls alone. It is also inappropriate to extrapolate the findings from an adolescent sample to pre-adolescent girls without further validation study. This study will
determine if there is a relationship between perceived competence and exercise behavior in pre-adolescent girls.

Theories of Parental Behavior

Parents are important role socializers (Greendorfer, 1983; Kenyon & McPherson, 1973). However, little parental behavior is consciously directed at shaping a child into a specific type of person (Weitz, 1977). A child's development is influenced more by the overall pattern of experiences (Orlansky, 1949), and it is the child's perceptions of parental behaviors which have greater relationship to child behavior than the actual parental activities (Ausubel et al., 1954; Bronfenbrenner, 1979; Schaefer, 1965a). Children's perceptions of ongoing parent-child social interactions are expected to be related to the child's behaviors in social roles (Bronfenbrenner, 1979). Kenyon and McPherson (1973) noted that "sport involvement reflects masculinity" (p. 311), and fathers' behavior is proposed to be more strongly related to children's exercise behavior, especially if the fathers are permissive parents (Kenyon & McPherson, 1973). Various authors have also suggested that the socialization of girls regarding physical activity differs from the socialization of boys (Gill, 1995; Greendorfer, 1983; The President's Council on Physical Activity and Sports, 1997). Therefore, the relationship of perceived maternal and paternal behaviors to girls' exercise should be examined separately.

Beginning from observational data concerning mother-child interactions, Schaefer (1959) proposed the construction of a circular rather than a linear model for generalized parental behavior categories from the universe of social and emotional interactions between one parent and one child (see Figure 1). The circular ordering of parental behaviors around intersecting axes, with no specific beginning or ending, reflects the natural relationships between categories of parental behaviors (Schaefer, 1961). The circular, or circumplex model of parental behaviors has three axes, acceptance vs. rejection, psychological autonomy vs. psychological control, and
firm direction-supervision vs. lax direction-supervision (Schaefer, 1965b) (Figure 1).

![Psychological Autonomy and Control Diagram](image)

Figure 1  Schaefer's Circumplex Model of Parental Behaviors (Used with permission. E.S Schaefer. October 24, 1998)

Baumrind (1966, 1971) proposed three prototypical patterns for parental behaviors that combine differing degrees of acceptance-rejection, psychological autonomy-control, and firm versus lax direction and supervision: authoritarian, authoritative, and permissive. Authoritarian parents emphasize obedience and conformity to absolute standards, and do not encourage discussion of the child's view. On the axes of Schaefer's (1965b) model, authoritarian parents, therefore, would be categorized at a high level on direction-supervision, but low on the acceptance and psychological autonomy-granting (Baumrind, 1966, 1971). Authoritative parents are also called democratic because they encourage discussion of standards and accept both parental and child rights. Conformity to standards is expected once the standards are set and authoritative parents expect to direct child behavior even while being affirming of the child as an individual. Authoritative parents are high on direction-supervision, psychological autonomy-granting, and acceptance (Baumrind, 1966, 1971). Permissive parents avoid exerting control over the child, make few demands for conformity to standards, and accept self-regulation of behavior by the child. Permissive parents are low on direction-supervision while being high on acceptance and psychological autonomy-granting (Baumrind, 1966, 1971).
Kenyon and McPherson (1973) proposed that parents who give many positive responses but few negative responses to their children will increase the children's participation in exercise. Thus, permissive mothers and fathers who are high on acceptance and psychological autonomy-granting, and low on direction-supervision should have girls who exercise the most (Kenyon & McPherson, 1973). Parents who are warm and nurturing will be more effective exercise behavior socializers than parents who are not warm and nurturing according to Kenyon and McPherson (1973). Authoritative parents, who are high on acceptance and psychological autonomy-granting, should be potent influences on girls' exercise behavior. However, authoritative parents are high on direction-supervision compared to permissive parents (Baumrind, 1966, 1971), and less permissive parents are less effective exercise behavior socializers (Kenyon & McPherson, 1973). Thus, authoritative mothers and fathers are expected to be less effective socializers of girls' exercise behavior than are permissive parents. Authoritarian mothers and fathers, who are simultaneously high on direction-supervision and low on acceptance and psychological autonomy-granting (Baumrind, 1966, 1971), will be the least effective exercise behavior socializers because they are the least permissive and least warm parents (Kenyon & McPherson, 1973).

Empirical Studies of Parent Behavior and Exercise

Behaviors of significant socialization agents are related to exercise behavior (Kenyon & McPherson, 1973). Two studies have linked non-specific maternal and paternal influence to girls' sport involvement and physical activity participation (Butcher, 1983; Greendorfer & Lewko, 1978).

Greendorfer and Lewko (1978) used a social learning framework for a study of parental influence on the active sport involvement of children, ages 8 to 13. Of the 95 subjects in the study, who were involved in a summer fitness program at the University of Illinois which attracts...
children with a general interest in physical activity, 28 were girls (Greendorfer & Lewko, 1978).

The questionnaire designed for the study by Greendorfer and Lewko contained nine items regarding active sport involvement and six questions about the influence of significant others. There were several components to active sport involvement combined in a single score. The physical activity component of the sport involvement score was the number of physical activities reported by the child. There were two parental influence questions, one each for mother and father, which did not define more specifically the nature of the influence. Multiple regression analyses were performed with active sport involvement as the dependent variable. The first regression analysis, with influence of family, peers and teachers as the explanatory variables, failed to explain the variance in sport involvement for girls. The second regression analysis, with parents and siblings as explanatory variables, showed that parental influence was a significant explanatory variable \( F(1, 54) = 8.244, p < .01 \) for the variance in girls' sport involvement. When the influences of mother, father, brother, and sister were used as separate explanatory variables, only the father's influence explained the variance in sport involvement for girls \( F(3, 108) = 3.31, p < .05 \) (Greendorfer & Lewko, 1978). As proposed by the sport socialization theory, paternal influence explained more of the variance in girls' sport involvement than maternal influence did.

Parental socialization and the encouragement of others were positively linked to the physical activity of girls (Butcher, 1983). Using the Kenyon and McPherson (1973) sport socialization theory, Butcher (1983) studied the socialization into physical activity for girls in grades 6 through 10. Of the 661 subjects, the largest group (207 girls) were in sixth grade, with the remainder distributed almost evenly through grades 7 to 10 (Butcher, 1983).

Butcher used six physical activity participation items to measure number and duration of daily physical activities, and 26 other variables were included to measure other components of
the sport socialization model. There was one item each for mother’s and father’s socialization influence (Butcher, 1983). Socialization influence was not explicitly described as behaviors.

Correlations of mother’s socialization and father’s socialization with community-based physical activity were $r = .36$ and $.30$ respectively ($p = .05$), and with average hours of physical activity per day were $r = .20$ and $.17$ respectively ($p = .05$) (Butcher, 1983). Mother’s socialization, but not father’s, correlated with total activities ($r = .21, p = .05$), and father’s socialization, but not mother’s, correlated with frequency of favorite activities ($r = .15, p = .05$) (Butcher, 1983). The correlations do not show a consistently larger association of exercise with fathers’ influence than with mothers’ as proposed by the sport socialization theory. Failure to use specific parent behaviors as variables may explain the inconsistent findings, or there may truly be a small relationship.

Parental influence or socialization appear to be linked with girls’ participation in physical activity. However, the evidence on the relative influence of mothers or fathers is conflicting. Greendorfer and Lewko (1978) and Butcher (1983) found that parental influence or socialization were linked with girls’ sports participation or physical activity, but one study’s results suggested father’s influence was stronger (Greendorfer & Lewko, 1978) while the other study found that mothers were more influential (Butcher, 1983). There are several limitations in the above studies. Specific parental variables were not delineated in either study. The researchers attempted to capture complex parental variables by using single item measures. Actual physical activity was incorporated into a more general variable labeled active sport involvement (Greendorfer & Lewko, 1978) that precluded finding a distinct relationship between parental behaviors and actual physical activity. The samples included a wide age range of girls (Butcher, 1983; Greendorfer & Lewko, 1978). The present study will determine whether
relationships between perceived parental behaviors and exercise behaviors hold when parental behaviors are more clearly delineated.

Theories of Parental Exercise

A social learning theory can account for socialization into physical activity roles through reinforcement, identification, or imitation (Kenyon & McPherson, 1973). According to social learning theory, observation of the behavior of others facilitates attempts to reproduce a desired behavior and produces a vicarious experience for the observer (Bandura, 1977, 1997). Observing behavior creates a mental construction of the behavior which can then be used to guide personal attempts to re-create the target behavior. This symbolic conception is available for use to guide performance attempts at any future time, even in the absence of the original model (Bandura, 1977). The personal relevance of the vicarious experience is enhanced when one perceives some similarity between the other person and oneself (Bandura, 1977, 1997).

Kenyon and McPherson (1973) based the sport socialization theory on social learning theory, and one method of sport socialization they identified is imitation of the behavior of others. They therefore proposed that participation in exercise by parents is related to participation in exercise by their children (Kenyon & McPherson, 1973). Theoretically, parental physical activities are imitated by their children, resulting in acquisition of those physical activity behaviors by the children (Woolger & Power, 1993). Greendorfer (1983) suggested that children imitate the behavior of their same-sex parent as they learn which behaviors are approved and which are not. However, vigorous physical activity has been labeled as a masculine activity, and on this basis Kenyon & McPherson (1973) proposed that fathers' exercise behavior will be imitated more than mothers' exercise behavior.

Empirical Studies of Parental Exercise

The habitual activity level of parents may influence the activity of children. To see if
family members' activity levels were related, Sallis, Patterson, Buono et al. (1988) recruited 197 families of fifth- and sixth-graders to be interviewed as part of a larger study of cardiovascular health education in southern California. Ninety-five Anglo and 102 Mexican-American families participated in structured interviews of mothers, fathers, and children using the seven-day Physical Activity Recall instrument (reliability for this sample was .81, \( p < .001 \)). Children were categorized as younger (mean age 11.4 years) or older (mean age 13.2 years). The dependent variables of kilocalories per kilogram of body weight per day (KKD) and time spent in vigorous leisure activities (Hard Leisure) were summary scores for each mother, father and child (Sallis, Patterson, Buono et al., 1988).

Correlations for spouse pairs, father-younger child, father-older child, mother-younger child, mother-older child, and sibling pairs were calculated for each dependent variable. Adjustment for body mass was found to produce no significant effect on the correlations. Correlations between mother and older child on both KKD and Hard Leisure were statistically significant for both Mexican-American and Anglo families (KKD: \( r = .35, p < .01 \) and \( r = .34, p < .05 \) respectively; Hard Leisure: \( r = .21, p < .05 \) and \( r = .45, p < .01 \) respectively). In Anglo families, mother-younger child correlation was \( r = .17, p < .05 \) for Hard Leisure, while in Mexican-American families the correlation in Hard Leisure for mother-younger child was \( r = .25, p < .01 \). In Mexican-American families, there were also significant correlations in KKD for father-older child (\( r = .55, p < .01 \)) and mother-younger child (\( r = .42, p < .001 \)) (Sallis, Patterson, Buono et al., 1988).

There were significant positive relationships between parental activity level and child activity level. Mothers' activity was related to younger and older children on Hard Leisure and KKD, while fathers' activity was only related to older children's kilocalories expended per day. One explanation for the findings is that children's activity patterns mimic parents' activity
patterns. This study did not examine whether the relationships varied according to the child's gender.

A study of slightly younger children and their parents used a different methodology but also showed a relationship between parents' and children's activity levels. Freedson and Evenson (1991) studied family activity patterns in a sample of 30 families of 5-9 year-old boys and girls and their biological parents, currently living together and with no physical handicaps or hyperactivity disorder.

Each family member wore a Caltrac accelerometer for a 3-day period to obtain physical activity frequency counts (CAL CT). The 50th percentile for mean CAL CT scores was used to categorize each family and then each subject as high or low activity (Freedson & Evenson, 1991). There was father-child similarity for 67% of families [$X^2(1, N = 30) = 3.45, p < .06$] and mother-child similarity for 73% of the families [$X^2(1, N = 30) = 6.72, p < .05$]. When both parents were in the high activity group, 97% of their children were classified as high activity by CAL CT score (Freedson & Evenson, 1991).

Parents also kept an activity diary (CAL REC), which recorded duration and intensity of types of activity as reported by the parents and the child. The diary information permitted calculation of minutes of low intensity and higher intensity activity by which families and then family members were categorized as high or low activity. Again, there was similarity on CAL REC scores for father-child pairs in 70% of families [$X^2(1, N = 30) = 5.81, p < .05$] and for mother-child pairs in 66% of families [$X^2(1, N = 30) = 4.21, p < .04$]. When both parents were categorized as high active by CAL REC score, 93% of their children were also labeled high active (Freedson & Evenson, 1991).

Family members had similar scores on the activity measures. High activity parents tended to have high activity children, and few high activity children were found among low
activity families (Freedson & Evenson, 1991). Although it is not possible to determine the influential factors in family activity patterns from this study, one possible explanation is that children assume activity patterns as a result of observing parents’ activity.

Report of exercising with parents was significantly related to pre-adolescent children's exercise. Stucky-Ropp and DiLorenzo (1993) examined the determinants of exercise in a sample of 121 girls and 121 boys in fifth- and sixth-grades with no limitations on physical activity. The children participated in structured interviews and completed questionnaires, and their mothers completed questionnaires. The interview data was used to calculate a “minutes spent in vigorous activity” mean score over the previous three days for each child, and this was the dependent variable. The questionnaires provided scores on social learning variables including direct parental modeling of exercise, self-efficacy for exercise, perception of friend/family modeling and support, enjoyment of physical activity, presence of equipment for exercise, knowledge about exercise, and hours spent in sedentary activity. Mothers also reported on frequency of activity and barriers to activity. Direct parental modeling was defined as child-reported exercising with parent (Stucky-Ropp & DiLorenzo. 1993).

Separate stepwise forward regression models were computed for boys and girls. For girls, enjoyment entered first \[ R^2 = .06, F(1, 119) = 7.34, p < .01 \], home exercise equipment entered second \[ R^2 \text{ change} = .02, F(2, 118) = 5.06, p < .01 \], mother’s report of family support entered third \[ R^2 \text{ change} = .02, F(3, 117) = 4.32, p < .01 \], mother’s perceived barriers entered at step four \[ R^2 \text{ change} = .012, F(4, 116) = 3.66, p < .01 \], and finally, at step five, the child’s report of direct parental modeling added \[ R^2 = .011, F(5, 115) = 3.24, p < .01 \] (Stucky-Ropp & DiLorenzo. 1993).

Direct parental modeling was related positively and significantly to girls’ reported activity in this study, but less strongly than other variables. Only mothers reported on their own
activity, and this variable was not related to girls’ activity. Since fathers did not participate in the study, the relationship of their activity to child activity could not be ascertained.

In the studies cited, parental and child activity levels were similar and related (Freedson & Evenson, 1991; Sallis, Patterson, Buono, et al., 1988). However, Stucky-Ropp and DiLorenzo (1993) did not find mothers’ activity to be related to child activity, and child report of exercise with parents accounted for only a 1% increase in the explained variance in children’s activity. These studies used samples of both boys and girls. One study did not include fathers. The present study will examine the relationship of each parent’s reported exercise with the self-reported exercise of pre-adolescent girls to see if the relationship between parent and child exercise proposed by Kenyon and McPherson (1973) holds.

Theoretical Rationale

Exercise is a multidimensional experience of regular physical activity sufficiently vigorous to lead to physical fitness (Brustad, 1993; Haskell et al., 1985; Rowland, 1990). Exercise habits are formed in childhood (Bandura, 1997; Brustad, 1991; Flaherty, 1986; Hester, 1987; Pender, 1975; Reynolds et al., 1990; Stucky-Ropp & DiLorenzo, 1993; U.S. Department of Health and Human Services, 1996). According to the sport socialization theory, exercise is a learned social role for which the individual possesses relevant personal attributes, receives systematic feedback from significant others, and observes others in the role (Kenyon & McPherson, 1973).

Perceived competence in exercise is theoretically related to exercise (Kenyon & McPherson, 1973). Perceived competence is the subjective reality of one’s abilities resulting from the accumulated outcomes of one’s efforts (White, 1960), and is the positive resolution of the central psychological crisis of middle childhood development, which encompasses pre-adolescence (Erikson, 1968). Perceived competence is organized by activity and children will
perceive themselves as more competent in some areas than in others (Harter, 1978; White, 1963). Differentiation of competence perceptions into athletic, social, cognitive, and global self-worth is present in children eight years of age and older (Harter, 1983).

The most important socializers for exercise before adolescence are parents (Greendorfer, 1983; Kenyon & McPherson, 1973). Parents perceived as permissive are the most effective socializers of exercise behavior for their children compared to those who are perceived as authoritative or those who are perceived as authoritarian (Kenyon & McPherson, 1973). Father is a more important parental socializer for exercise than mother (Kenyon & McPherson, 1973).

A vicarious experience produced by observing others' activity is important in behavior learning (Bandura, 1977). The salience of the observed behavior is enhanced when one perceives some similarity between the other and oneself (Bandura, 1977, 1997). Children imitate parents' behavior, and therefore, participation in exercise by parents is related to participation in exercise by their children (Kenyon & McPherson, 1973). Greendorfer (1983) proposed that children imitate the behavior of their same-sex parent as they learn behaviors. However, Kenyon & McPherson (1973) proposed that fathers' exercise behavior will be imitated more than mothers' exercise behavior since vigorous physical activity has been labeled as a masculine activity.

Hypotheses

1. There is a positive relationship between perceived competence and exercise behavior of pre-adolescent girls.
   1a. Perceived athletic competence is positively correlated with exercise behavior.
   1b. Perceived cognitive competence is positively correlated with exercise behavior.
   1c. Perceived global self-worth is positively correlated with exercise behavior.
1d. The set of variables including perceived athletic competence, perceived cognitive competence, and perceived global self-worth explains more of the variance in exercise behavior than the independent variables taken alone.

2. Exercise behavior of pre-adolescent girls differs according to parent behavior patterns.

   2a. Girls who report permissive paternal behavior pattern report greater exercise than those who report authoritative or authoritarian paternal behavior patterns; girls who report authoritative paternal behavior pattern report greater exercise than those who report authoritarian paternal behavior pattern.

   2b. Girls who report permissive maternal behavior pattern report greater exercise than those who report authoritative or authoritarian maternal behavior patterns; girls who report authoritative maternal behavior pattern report greater exercise than those who report authoritarian maternal behavior pattern.

3. There is a positive relationship between parental exercise and exercise of pre-adolescent girls.

   3a. Paternal exercise is positively correlated with girls' exercise behavior.

   3b. Maternal exercise is positively correlated with girls’ exercise behavior.

**Research Questions**

1. What is the relationship between perceived social competence and exercise behavior?

2. Is paternal exercise or maternal exercise correlated more strongly with girls’ exercise?
Chapter III

Methods

This chapter presents the design of a cross-sectional correlational study that tested explanatory theory. The study includes the dependent variable of exercise behavior of fifth- and sixth-grade girls and the independent variables of girls' perceived competence, girls' perceived parental behavior patterns, and parental exercise. The research setting, the sample, the research instruments, procedures for recruiting subjects, and data collection procedures are described.

Research Setting

Data collection for girl subjects was conducted in classrooms with girls who were attending regular fifth- and sixth-grade classes. Given that regular school class sizes currently tend to range from 20 to 30 students per classroom, of which approximately one-half were expected to be girls, a sufficient number of classes were needed for an adequate pool of potential subjects. Nine public schools housed in five public school districts serving neighborhoods in northern New Jersey served as research sites with the approval of school officials. Parents responded to questionnaires in the home.

Sample

The convenience sample was comprised of girls attending regular fifth- and sixth-grade classes who were deemed by their parents to be in good health, and who resided in homes with biologic or adoptive mothers and fathers. To assure girls' ability to read and understand English, bilingual and English-as-a-second-language classes were not used. Children attending special education classes were not invited to participate in this research to assure ability to comprehend and follow the directions for data collection. Parents were required to be able to read and write in order to provide consent for their daughters' participation and to provide data concerning their own exercise via written questionnaire.
A medium effect size for regression ($f^2 = .15$) was anticipated for this study. Given a lambda of 13 and an effect size of .15, a sample size of 80 subjects was planned to provide power of .80 for multiple regression (Cohen, 1988). For analysis of variance (ANOVA) in three groups with a medium effect ($\omega^2 = .06$), a total sample of 150 subjects, 50 for each group, was planned to assure adequate power of .80 to detect group differences (Keppel, 1991). Sampling continued until 155 girls, their mothers, and their fathers were recruited.

Of the 155 girls in the final sample, 51% were fifth-graders and 49% were sixth-graders. No parents reported that their daughters were barred from physical activity due to illness or disability. One hundred, sixteen girls (75%) were reported by their parents to not yet be menstruating, and 36 (23%) were reported to have reached menarche. No information on menarche was provided for three girls. The Levene test for equality of variance between the menstruating and non-menstruating girls was $F = .11, p = .74$, indicating that the null hypothesis of no difference between the groups cannot be rejected. A t-test for differences in exercise between these two groups revealed $t(150) = 1.08, p = .28$. Average exercise intensity is not different between pre- and post-menarcheal girls in fifth and sixth grades in this sample. The demographic characteristics of the girls are summarized in Table 1.

Parents were predominantly white (60.4%), and had a mean of 13.8 years of education. Most parents' occupations could be classified as professional/managerial or technical support, using the 1990 United States Census occupation categories. All but 28 parents indicated that they were in good health, and only two parents reported impediments to physical activity. The demographic characteristics of the parents are summarized in Table 2.
Table 1.

Demographic Data for Girls

<table>
<thead>
<tr>
<th>Demographic variables</th>
<th>Girls</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>Per cent</td>
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<tr>
<td>Grade</td>
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<td>Sixth</td>
<td>76</td>
<td>49.0</td>
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<td>Health</td>
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<td></td>
<td>Parent-reported problems but no activity restrictions</td>
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<td>Parent-reported problems and activity restrictions</td>
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<td>0</td>
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<tr>
<td>Menstrual status</td>
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<tr>
<td></td>
<td>Post-menarcheal</td>
<td>36</td>
<td>23.7</td>
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Table 2.

Demographic Data for Parents

<table>
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<tr>
<th>Demographic variables</th>
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<th>Father</th>
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<td><strong>Years of Range</strong></td>
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<td>5-23</td>
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<tr>
<td><strong>Education: M SD</strong></td>
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<td>13.81</td>
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<tr>
<td></td>
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<td>Hispanic</td>
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<td>8.5</td>
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<td>1.4</td>
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<td></td>
<td>2.8</td>
<td>3.8</td>
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<td><strong>Health:</strong></td>
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<td></td>
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<tr>
<td>Good, no activity restrictions</td>
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<td>135</td>
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<td>88.9</td>
<td>92.5</td>
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<td>Self-reported problems but no activity restrictions</td>
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</tr>
<tr>
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Instruments

The Child/Adolescent Activity Log (CAAL), The Self-Perception Profile for Children (SPPC), The Children’s Report of Parent Behaviors (CRPBI), a vigorous activity scale, a moderate activity scale, and a family information sheet were used to collect data from preadolescent girls and their parents for this study. Each of these tools is described in the following section.

Child/Adolescent Activity Log (CAAL)

The Child/Adolescent Activity Log (CAAL) is a 22-item measure designed to assess children’s activity patterns (Garcia et al., 1997). A longitudinal study was conducted to develop this instrument, with data collection during six one-week periods at different seasons over two years, winter 1992, spring 1992, fall 1992, winter 1993, spring 1993, fall 1993. A sample of 459 students from two age cohorts, fifth- and sixth-grade students and eighth-grade students, was drawn from two low socioeconomic school districts in the Midwest. The sample was 49% male and 51% female, 59% Caucasian and 35% African-American (Garcia et al., 1997).

The instrument has 21 activity categories as well as an “other” activity category with space for the child to specify activities not listed. The snow activities category was expanded to include skiing and snowboarding, and field hockey was included with ice hockey, with the permission of the author (A.W. Garcia, personal communication, March 6, 1998). The instrument is designed to be completed in a classroom setting and to provide data concerning activity over a period of seven consecutive days. On Monday, the children completed three logs, one for each of the three previous days, Friday through Sunday. On each subsequent day, Tuesday through Friday, the children completed one log for the previous day (Garcia et al., 1997). Children were instructed to mark an activity category and the most appropriate of seven possible time interval choices for each activity in which they participated on a preceding day.
Reliability. Reliability of the CAAL was established by test-retest procedures. A subset of 25 eighth-grade subjects completed the CAAL at the beginning and again at the end of a 45-minute period daily for one data collection week. Total daily intensity scores and average intensity scores were obtained. Correlations between pre- and post-daily intensity scores ranged from .73 to .94. Test-retest reliability coefficient for the pre- and post- average intensity scores was .95, indicating stability of the instrument over a 45-minute and one week time period. Paired t tests comparing pre- and post-test daily intensity scores and paired t tests comparing pre- and post-test average intensity scores were non-significant, indicating that there was no significant difference in scores (Garcia et al., 1997).

Content validity. The advice of physical education experts and a pilot study of 20 pre-adolescents in summer camp provided the 17 original items for the instrument. This original tool was then used for data collection at two time points, in the winter and spring of 1992. After these data were collected, the “other” activity category was analyzed for possible new activity categories. Five new activity categories were added based on the frequent mention of gymnastics, calisthenics, martial arts, weightlifting, and wrestling by respondents and “frisbee” was combined with “recess games” due to infrequent selection (Garcia et al., 1997). The present instrument lists 21 activity categories plus the “other” activity category.

Criterion-related validity. Criterion validity was determined through correlation of CAAL scores with Caltrac scores and fitness indices (Garcia et al., 1997). The Caltrac is an electronic accelerometer that is a reliable and valid measure of energy expenditure (Nolan, Danner, Dewalt, McFadden, & Kotchen, 1990; Sallis, Buono, Roby, Carlson, & Nelson, 1990). Total activity scores for subsamples of fifth-, sixth- and eighth-grade boys and girls on the CAAL at each data collection phase (n = 21-48) were moderately correlated with the duration of accelerations measured by the Caltrac (r = .31 to .47, p < .05) (Garcia et al., 1997). Comparison
of average intensity scores with fitness indices in the longitudinal sample of 459 fifth-, sixth- and eighth-graders was done as well. There were small, positive correlations between average intensity scores and numbers of sit-ups and push-ups subjects performed (r = .14 to .27, p < .05), and negative correlations between average intensity scores and heart rate (r = -.13 to -.23, p < .05) (Garcia et al., 1997).

The CAAL distinguishes between groups having known differences in activity and fitness. For each season in which data were collected, average daily duration scores for “high activity” and “low activity” groups of 459 fifth-, sixth- and eighth-grade boys and girls were compared by t tests. There were statistically significant differences (p < .01, two-tailed tests), with high activity subjects (n = 113 to 195) having higher duration scores than low activity subjects (n = 84 to 138) (Garcia et al., 1997). The average intensity scores of the subjects who completed all three fitness step test stages (across seasons, n = 82 to 176) were compared by t test with the scores of the subjects who completed one to two stages (across seasons, n = 52 to 146). As expected, those who completed all three step stages had higher average intensity scores (p < .05, two-tailed tests) than those who completed fewer than three stages (Garcia et al., 1997).

**Construct validity.** Construct validity of the CAAL was determined by hypothesis testing. It was hypothesized that overall activity would vary by season, and that some activities would be chosen more frequently at some seasons of the year than at others. Among the 459 fifth-, sixth- and eighth-grade boys and girls, football was endorsed by more respondents in the fall (40.4% Fall ‘92 vs. 13.1% Spring ‘93), snow activities were more popular in the winter (22.9% Winter ‘93 vs. 0% Spring ‘93), and softball/baseball was chosen more often in the spring (29.8% Spring ‘93 vs. 7.2% Fall ‘93). Among a sub-set of 94 participants, season of the year had a statistically significant effect on duration of activity [F(2, 91 = 9.76, p < .001] and on intensity of activity [F(2, 91) = 6.43, p < .01] (Garcia et al., 1997).
Based on reports in the literature, the investigators anticipated that student activity levels would decline with age and differ by gender (Garcia et al., 1997). There was a significant gender difference in exercise intensity among the fifth-, sixth- and eighth-graders, with boys (n = 225) having higher energy expenditure scores than girls (n = 234) at each data collection period \( [F(1.92) = 4.63, p < .05] \). Activity decreased in the expected direction over the two years of the longitudinal study, although the results did not reach the established significance level of \( \alpha = .05 \) (Garcia et al., 1997).

**Scoring.** The CAAL is designed to allow scoring in three ways, a frequency count, duration of activity, and intensity of activity (Garcia et al., 1997). The average intensity score was used as a measure of exercise behavior for this research. A metabolic cost value (kilocalories expended per minute per kilogram of body weight with a correction factor for child metabolic rate) assigned to each activity was multiplied by the number of minutes of the activity and the activities' values were summed to obtain a daily activity intensity score. The average intensity score (daily average caloric expenditure per minute per kilogram of body weight) was calculated by dividing the summed daily activity intensity scores by the number of days of data collection (Garcia et al., 1997). In this study, data were collected for seven days. Daily intensity score can range from 0 (no activity reported) to 322.24 if 21 activities are reported, each lasting two hours (two hours is the longest duration choice given).

**The Self-Perception Profile for Children (SPPC)**

The Self-Perception Profile for Children (SPPC) measures children's specific judgments in six domains that form the sub-scales for the instrument: scholastic competence, social acceptance, athletic competence, global self-worth, physical appearance, and behavioral conduct (Harter, 1985). These sub-scales tap perceptions of school-related cognitive competence, acceptance by peers, physical competence in sports and outdoor games, a general perception of
worth as a person, happiness with personal appearance and happiness with one's own behavior.

The SPPC has 36 items, with six items for each sub-scale. Each item presents a dichotomous descriptive statement that requires the child to choose which side of the description is most like him/her, e.g., "Some kids often forget what they learn but other kids can remember things easily," and then whether the statement is "a lot like" or only "sort of like" him/her. In this study, the four sub-scales which correspond to the four perceived competence variables (perceived athletic competence, perceived social acceptance, perceived scholastic competence, and perceived global self-worth) were used. Since the sub-scales are conceptually and empirically distinct, it is most appropriate to use sub-scale scores rather than summing item responses to obtain a single competence score (Harter, 1982, 1985. personal communication, Feb. 13, 1998).

Reliability. Test-retest reliability for the original sub-scales in a sample of 341 boys and girls in third- through sixth-grade ranged between $r = .70$ and $r = .87$ over three months (Harter, 1982). Internal consistency reliability for the revised sub-scales of the SPPC for 133 third-, 117 fourth-, 101 fifth-, and 612 sixth-grade boys and girls were as follows: cognitive or scholastic competence, $\alpha = .80$ to .85; social competence, $\alpha = .75$ to .80; physical or athletic competence, $\alpha = .80$ to .86; and general self-worth, $\alpha = .78$ to .84 (Harter, 1985).

Content validity. The SPPC was conceptualized within competence motivation theory (Harter, 1978; White, 1963). Harter (1982) developed the original scale, Perceived Competence Scale for Children (PCSC), and included representative items from existing tools for the following areas: self-worth and competency in the cognitive, social, and physical realms (Harter, 1982). Subsequent development of the instrument consisted of revision of some of the original items and adding two additional sub-scales, physical appearance and behavioral conduct. Items for the latter sub-scales emerged from interviews with children. Revisions of the tool were made
based on results of statistical analyses of data from four samples of 178 to 748 middle-class boys and girls in grades three through eight (Harter, 1985). The SPPC has face validity (Harter, 1982).

**Construct validity.** Initial construct validity was shown for the 40-item PCSC through orthogonal and oblique factor analysis in which the same stable factor structure emerged for both solutions (Harter, 1982). Tested with 215 third through sixth grade students with 10 items in each sub-scale, the theorized four-factor structure emerged, but only six or seven items on each sub-scale met criteria for retention (Harter, 1982). Further factor analytic work with a revised 28-item, four sub-scale instrument has resulted in six items per sub-scale, for a total of 36 items on the current SPPC (Harter, 1985). Oblique factor analysis of the revised SPPC focused on five of the competence areas (scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct). The five theorized factors emerged for 1,543 students in grades 5 through 8 (Harter, 1985). A correlation matrix of scores across samples of fifth- to eighth-graders revealed relatively distinct sub-scales with correlations between athletic competence and scholastic competence of $r = .12 - .24$; for athletic competence and social acceptance, $r = .31 - .44$; for global self-worth with athletic competence, social acceptance, and cognitive competence $r = .30 - .54$ (Harter, 1985).

Construct validity was further supported by the correlation between cognitive competence scores on the PCSC and measures of intrinsic motivation: preference for challenge ($r = .57$), independent mastery ($r = .54$), and curiosity ($r = .33$) in a sample of third- through sixth-grade boys and girls (Harter, 1982). Additionally, 50 sixth-grade students categorized as high perceived cognitive competence on the PCSC chose significantly more difficult puzzles than those categorized as low perceived cognitive competence [$t(48) = 3.6, p < .001$] (Harter, 1982). Construct validity was also demonstrated by the finding of higher perceived physical and social...
competence in 23 sixth-grade students chosen for sports teams than in 57 other students not chosen for sports teams \( t(78) = 3.4 \) and 2.5, \( p < .001 \) and \( p < .01 \), respectively] in a school where athletic accomplishment had high value (Harter, 1982).

Convergent validity was suggested for the PCSC by observing correlations between teacher and children's ratings of cognitive competence \( (r = .28 \) to .73, \( p = .05 \)) and physical competence \( (r = .62, p = .05) \) \( (n = 746 \) boys and girls across grades 3-6). Ratings by 85 fourth-, fifth- and sixth-grade boys and girls on a sociometric index based on peer ranking correlated moderately \( (r = .59, p = .05) \) with the perceived social competence sub-scale scores in this sample (Harter, 1982).

Scoring. The item score range is 1 to 4, with 1 signifying low perceived competence and 4 indicating high perceived competence. Items are presented in a sequence that rotates through the sub-scales, with half of the items for each sub-scale presenting the high perceived choice first. Scores are summed and averaged for each sub-scale, resulting in a sub-scale score range between 1 and 4. High scores indicate higher perceived competence (Harter, 1985).

Since its development, the SPPC has been used by several investigators in studies of children ages 8 to 16 years, in grades 3 through high school, to measure perceptions in four competence domains, cognitive, athletic, social, and global self-w orth (Brustad, 1993; Duncan & Duncan, 1991; Klint & Weiss, 1987; Roberts et al., 1981; Steinberg et al., 1992; Weiss & Duncan, 1992; Weiss, Ebbeck, McAuley, & Wiese, 1990; Weiss & Horn, 1990; Williams & Gill, 1995). The SPPC has an extensive history of development and use in research. There is evidence of reliability and validity for this instrument for use with fifth- and sixth-grade children.

Children's Report of Parent Behavior Inventory (CRPBI)

The Children's Report of Parent Behavior Inventory (CRPBI) is a set of scales for rating a systematic sample of parent behavior concepts (Schaefer, 1965 a, b) which indicate social and
emotional interaction of a parent with an individual child (Schaefer, 1959). The CRPBI is an instrument that can be used reliably by unskilled persons with little training to study relationships and differences in the psychological environments of boys and girls (Droppelman & Schaefer, 1963; Schaefer, Bell & Bayley, 1959). It is designed to overcome limitations associated with single item measures and is appropriate for both mothers and fathers (Droppelman & Schaefer, 1963). There are several versions of the CRPBI, ranging from 260 to 56 items (Burger, Armentrout, & Rapfogel, 1973; Droppelman & Schaefer, 1963; Margolies & Weintraub, 1977; Schluderman & Schluderman, 1970; Schaefer, 1961). The CRPBI requires 40 minutes to complete the 260-item form of the tool (Straus & Brown, 1978). The 56-item version of the CRPBI will be used for this study.

**Reliability.** Internal consistency reliabilities for the three factors across four samples (680 individuals from 170 families) ranged from $\alpha = .78$ to $.93$ for acceptance-rejection, $\alpha = .76$ to $.82$ for psychological control-psychological autonomy, and $\alpha = .70$ to $.78$ for firm control-lax control (Schwarz, Barton-Henry, & Pruzinsky, 1985). Test-retest reliability coefficients over five weeks ranged from $r = .77$ to $.93$ ($p < .001$) across the three factors and two parents in fourth- through sixth-grade children (Margolies & Weintraub, 1977).

**Content validity.** Content validity of the CRPBI was established by extracting a set of maternal behavior concepts from the literature and identifying actions which defined concepts related to the target concepts of love vs. hostility and autonomy vs. control (Schaefer, 1959, 1961; Schaefer et al., 1959). An effort was made to choose behaviors which would be observed in both mothers and fathers. Inter-rater reliabilities for choosing the initial behavior scales ranged from $.70$ to $.89$ (for mothers from child’s birth to three years of age) and from $.75$ to $.95$ (mothers of 9 to 14 year-old children) (Schaefer et al., 1959).
Construct validity. Construct validity of the CRPBI has been established through factor analysis. Orthogonal factor analysis of mothers’ ratings of items obtained from 18 behavior scales on two separate groups (56 mothers with children 0 to 3 years, and 34 mothers with children 9 to 14 years) each resulted in the same two factor solution: Love vs. Hostility and Autonomy vs. Control (Schaefer, 1959). Subsequent factor analysis with 246 boys and girls in seventh-grade, using orthogonal rotation of a 26-scale, 10 item per scale instrument with parallel forms for mother and for father resulted in a single nurturance factor and two control dimensions (covert, indirect psychological control and overt, direct physical control) (Droppelman & Schaefer, 1963; Schaefer, 1961; Schaefer, 1965b). These three factors (acceptance-rejection, psychological autonomy-psychological control, firm control-lax control) have been replicated in numerous studies using all the shorter versions of the CRPBI as well as the 26-scale version (Armentrout & Burger, 1972; Burger & Armentrout, 1971; Burger, Armentrout, & Rapfogel, 1973; Burger, Lamp, & Rogers, 1975; Droppelman & Schaefer, 1963; Graybill & Gabel, 1978; Margolies & Weintraub, 1977; Schluderman & Schluderman, 1970; Schwarz et al., 1985). The three factors have accounted for 61% (Graybill & Gabel, 1978), 66% (Schaefer, 1965b), and 68.4% (Schluderman & Schluderman, 1970) of the total variance in children’s perceptions of their parents’ behaviors, and the same factor structure has been demonstrated for samples of children from grades 2 through college freshmen (Armentrout & Burger, 1972; Burger & Armentrout, 1971; Burger et al., 1975; Graybill & Gabel, 1978; Margolies & Weintraub, 1977; Schluderman & Schluderman, 1970; Schwarz et al., 1985). Distinctiveness of the three factors is suggested by finding low to moderate correlations between acceptance-rejection and psychological autonomy-psychological control (r = .06 to r = -.45, p < .05), between psychological autonomy-psychological control and firm control-lax control (r = -.28 to r = -.42, p < .05), and between acceptance-rejection and firm control-lax control (r = -.28 to r = .19.)
Scoring. The CRPBI items are scored from 1 (Not True at All) to 3 (Very True). Twenty-six items are reversed for scoring. Items in each sub-scale corresponding to the factors are summed to obtain a sub-scale score. Twenty-four items make up the acceptance sub-scale, with a possible range of scores from 24 to 72. Higher scores indicate greater parental acceptance behavior. Psychological autonomy-granting scores (16 sub-scale items) can range from 16 to 48, with higher scores indicating greater parental psychological autonomy-granting. For the 16-item direction-supervision sub-scale, scores can range from 16 to 48, with higher scores reflecting greater parental direction and supervision (Margolies & Weintraub, 1977; S. Weintraub, personal communication. June 26, 1997).

In summary, the Children's Report of Parent Behavior Inventory has been used and studied extensively since its development. The results of several investigations show this tool to be both reliable and valid in several versions and in samples of children ranging in age from early school-age to late adolescence.

Vigorous and moderate physical activity scores

Sallis and colleagues developed a series of questions for their community-based study of adult exercise habits among residents of four cities in California (Sallis et al., 1985). A total of 2,504 people aged 11 to 74 years were interviewed, and data from 1,120 women and 1,006 men aged 20 to 74 years were analyzed and reported (Sallis et al., 1985).

Frequency, duration and intensity of the activity determine the vigor of the exercise. Exercise that occurs at least three times per week, non-stop for at least 20 minutes each time, at 60% or more of the individual’s aerobic capacity, and requiring an average energy expenditure of six kilocalories per kilogram of body weight per day produces a significant cardiovascular conditioning effect (Sallis et al., 1985). Participants who indicated that they had participated
regularly over the past three months in any of five activities were considered to be obtaining a conditioning effect from their vigorous activities: jogging or running ten miles per week, strenuous racquet and team sports for five hours per week, bicycling fifty miles per week, and swimming two miles per week (Sallis et al., 1985).

Sallis et al. (1985) were also interested in less intense activity and arbitrarily defined moderate physical activities as those requiring an energy expenditure of three to five times resting caloric expenditure (3-5 METs). This group of activities included walking instead of driving, walking from a parking area, walking on lunch hour or after dinner, walking from a bus stop, climbing stairs, and other everyday activities (Sallis et al., 1985). The vigorous physical activity score and moderate activity score were used for this study.

Reliability. As part of a four-city community-based study in southern California of the exercise habits of 2.126 men and women aged 20 to 74 years, a sub-set of 53 subjects were sampled for two-week test-retest reliability of the moderate activities and vigorous activities scores. For the vigorous activities score, two-week test-retest reliability was $r = .83$, $p = .0001$. Test-retest reliability over two weeks for the moderate activities score was $r = .75$, $p = .0001$ (Sallis et al., 1985).

Criterion validity. Decreased resting heart rate develops with regular physical activity (Astrand & Rodahl, 1970; Karvonen, Kentala, & Mustala, 1957; Rowland, 1990; Upton, Hagan, Rosentswie, & Gettman, 1983). Using the moderate and vigorous physical activity scores, Sallis and his colleagues found lower heart rates among men [$F(3.3808) = 23.97$, $p = .0001$] and women [$F(3.3232) = 17.65$, $p = .001$] ages 20 to 35 reporting vigorous exercise than among those reporting no vigorous activity in a cross-sectional study (Sallis et al., 1986). For a longitudinal sample of 250 men and 281 women drawn from the same group of subjects, those who maintained vigorous activity as measured by the vigorous physical activity score had lower heart rates.
rates than those who did not maintain vigorous activity ($p = .009$) (Sallis et al., 1986). Thus the vigorous physical activities score demonstrated criterion validity, distinguishing vigorously active adults from others.

**Scoring.** To obtain a vigorous physical activity score, the “yes-no” responses to each vigorous physical activity are summed, with a range of possible scores from 0 (“no” response to all activities) to 5 (“yes” response to all activities). The higher the score, the more vigorous intensity of exercise reported (Sallis et al., 1985). For a moderate physical activity score, the “yes-no” responses to each moderate physical activity are summed, with a range of possible scores from 0 (“no” response to all activities) to 6 (“yes” response to all activities). The higher the score, the more moderate exercise is done (Sallis et al., 1985).

For both moderate and vigorous physical activities scores there is evidence of reliability. There is evidence of validity for the vigorous physical activities score.

**Family Information Form**

The family information form (see Appendix A) was used to collect data on highest grade attained in school, occupation, and racial or ethnic background from parents. Parents were asked to confirm the absence of a physical condition that would preclude exercise by themselves or by their daughters, and to indicate their daughters’ menarcheal status.

**Procedures**

Permission to conduct the study was obtained from Rutgers University Institutional Review Board (Appendix B). The investigator began contacting public school superintendent offices in northern New Jersey for the purpose of explaining the study and the role of the school. A total of 24 school districts were approached over the course of one year and affirmative responses were received from five school districts (21% of total). Once the study was approved by the superintendent’s office, the investigator met with school principals and teachers or staff...
designated by principals to assist in the implementation of the research in nine schools. The investigator recruited subjects by explaining the study and distributing study packets during the regular school day in class. Students were instructed to take information packets home and give them to their parents. The packet of materials contained a letter describing the study and the nature of the parent’s and the daughter’s participation, duplicate parental consent forms, a family information form and parental physical activity questions. Parents were instructed in the letter to read the materials carefully, to sign the consent forms and retain one for themselves, to complete the family information form and parental physical activity questions. Parents did this at home at their convenience and returned one signed parental consent form, the family information form, and the parental activity questions to the investigator in the pre-addressed, stamped envelope included in the research packet. Children who agreed to participate signed a consent form on the first day of data collection.

A reminder card about the request for study participation was distributed to all girls seven days following the initial distribution of packets and again seven days after the first follow-up using the method described by Dillman (1978). Girls’ participation required consent from one parent and assent from the daughter. Over the course of one year, 768 packets were distributed, and 207 parent-daughter pairs agreed to participate. This resulted in a response rate of 27%. All students and parents who gave consent were included in data collection. Data were collected from 19 ineligible students (e.g., single-parent family) to avoid stigmatizing the child, but were not used in the data analysis. One girl declined to participate although she had parental consent, and one parent requested removal of his daughter from the study after the first day of data collection. Data collection from 26 girls was incomplete, and so they were dropped from the study before analysis. There were 155 usable questionnaires in the final data analysis (75% of the total responses).
Shortly before the scheduled first data collection day in each school, the investigator supplied the school with a list of girls who had volunteered. The first data collection period in each school occurred after sufficient time to receive parental consents and activity information and family data and at the date and time preferred by the school (Table 3).

Table 3.

Data Collection Procedure

<table>
<thead>
<tr>
<th>Event</th>
<th>Day 1</th>
<th>Day 7-10</th>
<th>Day 14-17</th>
<th>Day 21</th>
<th>Day 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research packet distributed</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeat request</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informed consent received</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>First data collection</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Last data collection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

On day one of data collection, the girls who had parental consent for participation and agreed to participate met in an area designated by the school, signed a consent form, and then completed two CRPBI forms, one reflecting mother's perceived behaviors and another reflecting father's perceived behaviors, and the SPPC. After completing these forms, the subjects filled out the first of the exercise logs, reporting on exercise of the previous day. These instruments were completed in one regular class period of approximately 45 minutes under the direction of the investigator. On days two through seven, the children continued with the exercise logs. Data were recorded to reflect the previous day's activity. The exception was Monday when they completed logs for activity on the previous Friday, Saturday, and Sunday.

The investigator was present in the school on day one of data collection to assure that the instructions to the participants were identical and to resolve any uncertainty about how to use the
instruments. A supply of exercise logs and envelopes for completed logs was kept in the school in an agreed upon classroom location that was accessible to the girls each day. The investigator met immediately before beginning data collection with teachers or other school staff who would supervise the girls’ completion of exercise logs on a daily basis. She reviewed instructions for reminding the participants to complete the logs. On the last day of data collection in each school, the investigator retrieved the sealed envelopes that contained the completed exercise logs. The girls retained the folders and pencils that were provided for the data collection activities.
Chapter IV

Analysis of the Data

The purpose of this study was to examine the relationships between the independent variables of perceived competence, perceived parental behaviors, and parental exercise and the dependent variable of pre-adolescent girls' exercise behavior as measured by average exercise intensity. Data from the final sample of 155 girls and their parents on the Self-Perception Profile for Children (SPPC), the Children’s Report of Parent Behavior Inventory (CRPBI), Parental Physical Activity Questionnaire, and Child/Adolescent Activity Log (CAAL) were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 10.0. This chapter presents the findings.

Statistical Description of the Variables

Girls’ average daily exercise intensity (expended kilocalories per kilogram) was 13.37 (SD=8.61) and the median score for daily exercise intensity was 10.10 kilocalories per kilogram as measured by scores on the CAAL. The girls’ average exercise intensity scores were highly variable, with scores ranging from 0.59 kilocalories per kilogram to 37.32 kilocalories per kilogram, and the distribution had a slight positive skewness (.79) that was not large enough to violate assumptions of normality (see Table 4). The data indicate that, on average, the girls had moderate activity levels. There were no differences among girls from different school districts for the dependent variable of girls’ exercise, although girls from different school districts differed on measures such as parental education, parental occupation, parental ethnicity, fathers’ exercise, and girls’ cognitive and athletic competence (see Tables 5, 6, 7, 8, and 9).

Girls’ exercise data were examined for outliers. The exercise intensity scores for five girls were revealed to be more than two standard deviations from the mean. Following re-examination of the data collection forms, these cases were dropped from the final analysis.
Table 4.

Statistical Description of Variables: Girls

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAAL: Children’s activity</td>
<td>0.59-37.32</td>
<td>13.37</td>
<td>8.61</td>
<td>10.10</td>
</tr>
<tr>
<td>SPPC: Competence perceptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive competence sub-scale</td>
<td>1.00-4.00</td>
<td>3.01</td>
<td>.71</td>
<td>3.00</td>
</tr>
<tr>
<td>Athletic competence sub-scale</td>
<td>1.17-4.00</td>
<td>2.94</td>
<td>.74</td>
<td>3.00</td>
</tr>
<tr>
<td>Social competence sub-scale</td>
<td>1.00-4.00</td>
<td>3.13</td>
<td>.67</td>
<td>3.33</td>
</tr>
<tr>
<td>Global self-worth sub-scale</td>
<td>1.33-4.00</td>
<td>3.30</td>
<td>.66</td>
<td>3.50</td>
</tr>
<tr>
<td>CRPBI: Girls’ parent behavior perceptions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>24.00-72.00</td>
<td>60.82</td>
<td>9.74</td>
<td>64</td>
</tr>
<tr>
<td>Fathers</td>
<td>24.00-72.00</td>
<td>59.05</td>
<td>11.08</td>
<td>62</td>
</tr>
<tr>
<td>Psychological</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>18.00-48.00</td>
<td>34.30</td>
<td>7.40</td>
<td>35</td>
</tr>
<tr>
<td>Fathers</td>
<td>16.00-48.00</td>
<td>36.57</td>
<td>8.29</td>
<td>38</td>
</tr>
<tr>
<td>Autonomy-granting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>24.00-48.00</td>
<td>38.56</td>
<td>4.80</td>
<td>39</td>
</tr>
<tr>
<td>Fathers</td>
<td>20.00-48.00</td>
<td>37.65</td>
<td>6.22</td>
<td>39</td>
</tr>
</tbody>
</table>

because their average daily duration of reported physical activity ranged from 6.7 to 12 hours. This was deemed to be a highly improbable amount of time to be spent in exercise on a daily basis, especially since the range of average daily minutes of exercise for the remaining 155 girls was 4.13 minutes to 295.8 minutes or .07 to 4.83 hours, with a mean of 1.8 hours.

Levels of girls’ competence perceptions were high. For each competence domain, the maximum possible score on the SPPC is 4.00 and the sample mean scores ranged from 2.94 for athletic competence to 3.30 for global self-worth (Table 4). Subjects rated themselves more highly in the competence areas of school performance (cognitive competence), social relations (social competence) and global self-worth than in physical activity ability (athletic competence),
but the mean scores in all of these competence categories were similar and above the 2.00 midpoint of the possible range of 1.00 to 4.00 for each sub-scale on the SPPC (Table 4).

Table 5.

**Differences among Girls from Five School Districts on Parental Occupation, Race/Ethnicity, and Health: Chi-square**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>df</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal occupation</td>
<td>141</td>
<td>20</td>
<td>65.34***</td>
</tr>
<tr>
<td>Paternal occupation</td>
<td>133</td>
<td>24</td>
<td>49.58**</td>
</tr>
<tr>
<td>Maternal race/ethnicity</td>
<td>142</td>
<td>20</td>
<td>107.52***</td>
</tr>
<tr>
<td>Paternal race/ethnicity</td>
<td>133</td>
<td>16</td>
<td>93.43***</td>
</tr>
<tr>
<td>Maternal health</td>
<td>153</td>
<td>8</td>
<td>4.05</td>
</tr>
<tr>
<td>Paternal health</td>
<td>146</td>
<td>8</td>
<td>5.54</td>
</tr>
</tbody>
</table>

*** p < .001 ** p < .01

Table 6.

**Differences among Girls from Five School Districts on Parental Education: Analysis of Variance**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Maternal education</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>23.32***</td>
<td></td>
</tr>
<tr>
<td>Within group error</td>
<td>142</td>
<td>(6.55)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Paternal education</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>13.47***</td>
<td></td>
</tr>
<tr>
<td>Within group error</td>
<td>135</td>
<td>(7.12)</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Values enclosed in parentheses represent mean square errors.

*** p < .001
Table 7.

Differences among Girls from Five School Districts on Parental Exercise: Analysis of Variance

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Paternal moderate exercise</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>4.19**</td>
<td></td>
</tr>
<tr>
<td>Within group error</td>
<td>134</td>
<td>(2.49)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Paternal vigorous exercise</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>3.31</td>
<td></td>
</tr>
<tr>
<td>Within group error</td>
<td>134</td>
<td>(.97)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Maternal moderate exercise</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td>Within group error</td>
<td>145</td>
<td>(2.79)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Maternal vigorous exercise</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>Within group error</td>
<td>144</td>
<td>(.46)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Values enclosed in parentheses represent mean square errors.

** p < .01
### Table 8.
**Differences among Girls from Five School Districts on Girls' Perceived Competence: Analysis of Variance**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Perceived cognitive competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>4.99**</td>
</tr>
<tr>
<td>Within group error</td>
<td>150</td>
<td>(.45)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Perceived social competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>.43</td>
</tr>
<tr>
<td>Within group error</td>
<td>150</td>
<td>(.46)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Perceived athletic competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>2.63*</td>
</tr>
<tr>
<td>Within group error</td>
<td>150</td>
<td>(.52)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Perceived global self-worth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>.54</td>
</tr>
<tr>
<td>Within group error</td>
<td>150</td>
<td>(.45)</td>
</tr>
</tbody>
</table>

*Note.* Values enclosed in parentheses represent mean square errors.

** p < .01  * p < .05

### Table 9.
**Differences among Girls from Five School Districts on Girls' Exercise: Analysis of Variance**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>df</th>
<th>Girls’ exercise intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools</td>
<td>4</td>
<td>1.17</td>
</tr>
<tr>
<td>Within group error</td>
<td>150</td>
<td>(73.76)</td>
</tr>
</tbody>
</table>

*Note.* Value enclosed in parenthesis represents mean square error.
Girls' reports of parents' behavior ranged from 24 to 72 for acceptance, 16 to 48 for psychological autonomy-granting, and 20 to 48 for direction-supervision (Table 4). Kenyon and McPherson (1973) proposed that children's exercise participation would differ depending on whether parents were permissive, authoritative, or authoritarian. The following methods were used to categorize parents into permissive, authoritative, and authoritarian groups.

The permissive parental behavior pattern exhibits less overt firm control through rule enforcement, more warm and nurturing acceptance, and more respect for the child's views and wishes (Baumrind, 1971; Schaefer, 1965a, b). Permissive maternal and paternal behavior each were operationalized as a score below the median on direction-supervision combined with scores above the median on acceptance and psychological autonomy-granting for each parent on the 56-item version (Margolies & Weintraub, 1977) of the CRPBI (Schaefer, 1965a, b). Based on this categorization, 23 mothers (14.8%) and 26 fathers (16.8%) were permissive (Table 10).

The authoritative parental behavior pattern exhibits more overt firm control through rule enforcement, more warm and nurturing acceptance, and more respect for the child's views and wishes (Baumrind, 1971; Schaefer, 1965a, b). Authoritative maternal and paternal behavior each were operationalized as combined scores at or above the median on direction-supervision, acceptance, and psychological autonomy-granting for each parent on the 56-item version (Margolies & Weintraub, 1977) of the CRPBI (Schaefer, 1965a, b). Based on this categorization, 25 mothers (16.1%) and 16 fathers (10.3%) were authoritative (Table 10).

The authoritarian parental behavior pattern exhibits more overt firm control through rule enforcement, less warm and nurturing acceptance, and less respect for the child's views and wishes (Baumrind, 1971; Schaefer, 1965a, b).

Authoritarian maternal and paternal behavior each were operationalized as a score above the median on direction-supervision combined with scores below the median on both acceptance and psychological autonomy-granting for each parent on the 56-item version (Margolies &
Weintraub, 1977) of the CRPBI (Schaefer, 1965 a, b). Based on this categorization, 20 mothers (12.9%) and 28 fathers (18.1%) were authoritarian (Table 10).

Table 10.

**Perceived Parental Behavior Patterns**

<table>
<thead>
<tr>
<th>Parent behaviors</th>
<th>Mothers (N = 155)</th>
<th>Fathers (N = 155)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptance</td>
<td>median = 64</td>
<td>≥ = 79</td>
</tr>
<tr>
<td></td>
<td>&lt; = 76</td>
<td>&lt; = 76</td>
</tr>
<tr>
<td>Psychological autonomy-granting</td>
<td>median = 35</td>
<td>≥ = 86</td>
</tr>
<tr>
<td></td>
<td>&lt; = 69</td>
<td>&lt; = 75</td>
</tr>
<tr>
<td>Direction-supervision</td>
<td>median = 39</td>
<td>≥ = 85</td>
</tr>
<tr>
<td></td>
<td>&lt; = 70</td>
<td>&lt; = 76</td>
</tr>
</tbody>
</table>

Sixty-eight mothers and 70 fathers fit into the three defined parental behavior patterns of permissive, authoritative, and authoritarian. Therefore, most parents (87 mothers and 85 fathers) fell into other patterns than permissive, authoritative, or authoritarian, and information about them was not used in the analysis (Table 10).

Parents did not engage in much vigorous activity. One hundred, twelve mothers (75.2%) and 81 fathers (58.3%) reported that they engaged in no vigorous activity at all, and the distributions of parental vigorous activity scores were highly skewed. Almost all parents (95.3% of mothers and 96.4% of fathers) reported some moderate activity on a regular basis, and the distributions of those scores were approximately normal. Table 11 summarizes the parental
Table 11.

Statistical Description of the Exercise Variables: Parents

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Range</th>
<th>Skewness</th>
<th>M</th>
<th>SD</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate activity scale:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>0.00-6.00</td>
<td>-.13</td>
<td>3.33</td>
<td>1.67</td>
<td>3</td>
</tr>
<tr>
<td>Fathers</td>
<td>0.00-6.00</td>
<td>.12</td>
<td>3.04</td>
<td>1.65</td>
<td>3</td>
</tr>
<tr>
<td>Vigorous activity scale:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mothers</td>
<td>0.00-3.00</td>
<td>1.92</td>
<td>.36</td>
<td>.70</td>
<td>0</td>
</tr>
<tr>
<td>Fathers</td>
<td>0.00-5.00</td>
<td>1.64</td>
<td>.70</td>
<td>1.02</td>
<td>0</td>
</tr>
</tbody>
</table>

exercise data.

Psychometric Properties of the Instruments

For internal consistency reliability, coefficient alphas higher than .70 are considered an acceptable level of reliability for research purposes (Polit & Hungler, 1995). All of the major scales had acceptable levels of reliability. Table 12 summarizes the reliability statistics for the present study.
Table 12.

Psychometric Properties of the Instruments

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Items</th>
<th>Coefficient alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPPC: Girls' Competence Perceptions</td>
<td>Athletic competence</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Cognitive competence</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Social competence</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Global self-worth</td>
<td>6</td>
</tr>
<tr>
<td>CRPBI: Girls' Mothers Acceptance Parental Perceptions</td>
<td>Acceptance</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Psychological autonomy-granting</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Direction-Supervision</td>
<td>16</td>
</tr>
<tr>
<td>Fathers</td>
<td>Acceptance</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Psychological autonomy-granting</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Direction-Supervision</td>
<td>16</td>
</tr>
</tbody>
</table>

Hypotheses

Hypothesis 1a

Hypothesis 1a stated that there will be a positive relationship between perceived athletic competence and exercise behavior of pre-adolescent girls. Hypotheses 1a was tested with a Pearson Product-Moment correlation coefficient for a one-tailed test of significance. The Pearson Product-Moment correlation for this relationship was $r = .27, p = .001$. Therefore, hypothesis 1a was supported.

Hypothesis 1b

Hypothesis 1b stated that there will be a positive relationship between perceived cognitive competence and exercise behavior of pre-adolescent girls. Hypotheses 1b was tested with a Pearson Product-Moment correlation coefficient for a one-tailed test of significance. The
Pearson Product-Moment correlation for this relationship was $r = .03, p = .69$, which was not statistically significant. Hypothesis 1b was not supported.

**Hypothesis 1c**

Hypothesis 1c stated that there will be a positive relationship between perceived global self-worth and exercise behavior of pre-adolescent girls. Hypotheses 1c was tested with a Pearson Product-Moment correlation coefficient for a one-tailed test of significance. The Pearson Product-Moment correlation for this relationship was $r = .14, p = .08$. Based on this finding, hypothesis 1c was not supported.

**Hypothesis 1d**

Hypothesis 1d stated that the set of variables, (a) perceived athletic competence, (b) perceived cognitive competence, and (c) perceived global self-worth will explain more of the variance in exercise behavior than the independent variables taken alone. Hypothesis 1d was tested by entering perceived competence variables simultaneously as independent variables in a multiple regression equation with girls’ exercise as the dependent variable.

The degree to which the assumptions underlying the use of multiple regression technique were met was evaluated. Examination of the histograms of scores for perceived competence revealed approximately normal distributions with slight negative skewness, but the skewness was not extreme enough to violate assumptions. Skewness was -.40 for athletic competence, -.63 for cognitive competence, -.80 for social competence, and -.90 for global self-worth ($SE = .20$). For perceived competence scores, visual inspection of normal P-P plots and scatterplots of residuals revealed linearity and constant variance indicating that model assumptions were not violated (Keppel, 1991; Moore & McCabe, 1993; Stevens, 1996).

Multicollinearity is another potential issue in regression. Examination of the correlation matrix revealed competence variable intercorrelations ranged from .29 to .54 (Table 13).
Table 13.

**Intercorrelations Between Sub-scales for Girls' Perceived Competence (N = 155)**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Perceived Cognitive Competence</td>
<td>---</td>
<td>.29</td>
<td>.29</td>
<td>.44</td>
</tr>
<tr>
<td>2. Perceived Athletic Competence</td>
<td>---</td>
<td>.48</td>
<td>.45</td>
<td></td>
</tr>
<tr>
<td>3. Perceived Social Competence</td>
<td>---</td>
<td></td>
<td>.54</td>
<td></td>
</tr>
<tr>
<td>4. Perceived Global Self-worth</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variable intercorrelations of .80 are typically considered to be evidence of multicollinearity (Berry & Feldman, 1985). Variance inflation factors for the perceived competence variables ranged from 1.25 to 1.43. Variance inflation factors greater than 10 are generally accepted as evidence of multicollinearity (Stevens, 1996). Evidence of multicollinearity was not present for this study.

The results of the simultaneous regression analysis shows that a one-variable model explains 8% of the variability in girls' exercise, $F(3,151) = 4.33$, $p = .006$ (Table 14). The only competence variable to enter the equation was perceived athletic competence. Therefore, hypothesis 1d was not supported.

Table 14.

**Summary of Simultaneous Regression Analysis for Competence Variables Explaining Girls’ Exercise (N = 155)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive competence</td>
<td>-.86</td>
<td>1.07</td>
<td>-.07</td>
</tr>
<tr>
<td>Athletic competence</td>
<td>3.16</td>
<td>1.03</td>
<td>.27**</td>
</tr>
<tr>
<td>Global self-worth</td>
<td>.69</td>
<td>1.21</td>
<td>.05</td>
</tr>
</tbody>
</table>

Note. $R^2 = .08$; $\Delta R^2 = .06$ ($p = .006$). **$p = .003$
Hypothesis 2a

Hypothesis 2a stated that pre-adolescent girls' exercise scores will differ according to the paternal behavior pattern they perceive (permissive, authoritarian, or authoritative). Permissive fathers' daughters had a mean exercise intensity of 13.54, while girls with authoritative fathers had a mean exercise intensity of 10.9, the lowest mean score. The highest mean exercise intensity score was 15.76 for girls with authoritarian fathers (Table 15).

Analysis of variance was used to test this hypothesis. A one-way ANOVA for girls' exercise intensity scores by perceived paternal parent behavior pattern was conducted using only those cases which had a permissive (26 cases), authoritative (16 cases), or authoritarian (28 cases) paternal behavior pattern. There was no statistically significant difference among the groups on girls' exercise \[F(2,67) = 1.75, p = .18\] (Table 16), so no planned comparisons were conducted. Hypothesis 2a was not supported.

Table 15.

Girls' Exercise in Parental Behavior Pattern Groups

<table>
<thead>
<tr>
<th>Parental Behavior Pattern Groups</th>
<th>Girls' exercise intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>Mother</td>
<td></td>
</tr>
<tr>
<td>Permissive</td>
<td>14.38</td>
</tr>
<tr>
<td>Authoritative</td>
<td>14.21</td>
</tr>
<tr>
<td>Authoritarian</td>
<td>11.72</td>
</tr>
<tr>
<td>Father</td>
<td></td>
</tr>
<tr>
<td>Permissive</td>
<td>13.54</td>
</tr>
<tr>
<td>Authoritative</td>
<td>10.90</td>
</tr>
<tr>
<td>Authoritarian</td>
<td>15.76</td>
</tr>
</tbody>
</table>
Table 16.

Analysis of Variance for Parent Behavior Patterns

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>F</th>
<th>Girls' exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother behavior patterns</td>
<td>2</td>
<td>0.73</td>
<td>(64.40)</td>
</tr>
<tr>
<td>Within group error</td>
<td>65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father behavior patterns</td>
<td>2</td>
<td>1.75</td>
<td>(69.63)</td>
</tr>
<tr>
<td>Within group error</td>
<td>67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Values enclosed in parentheses represent mean square errors.

Mother behavior patterns, \( p = .49 \); Father behavior patterns, \( p = .18 \)

Hypothesis 2b

Hypothesis 2b states that pre-adolescent girls' exercise scores will differ according to the maternal behavior pattern they perceive (permissive, authoritarian, or authoritative). Permissive mothers' daughters had a mean exercise intensity of 14.38, and girls with authoritative mothers had a mean exercise intensity of 14.21. The lowest mean exercise intensity was 11.72 for girls with authoritarian mothers (Table 15).

Analysis of variance was used to test this hypothesis. A one-way ANOVA for girls' exercise intensity scores by perceived maternal parent behavior pattern was conducted using only those cases which had a permissive (23 cases), authoritative (25 cases), or authoritarian (20 cases) maternal behavior pattern. There was no statistically significant difference among the groups on girls' exercise \([F(2,65) = .73, p = .49]\) (Table 16). Consequently, no planned comparisons were carried out. Hypothesis 2b was not supported.

One potential problem which may result in violation of statistical assumptions for analysis of variance is unequal parental behavior pattern group sizes. Since group sizes were somewhat unequal, the parental behavior pattern group variances were examined for
homogeneity. For both the paternal and the maternal behavior pattern groups, the Levene statistic for homogeneity of variances was non-significant (paternal groups: .18, p = .84; maternal groups: 2.16, p = .12), indicating that the null hypothesis of no significant differences between groups could not be rejected (Keppel, 1991).

Hypothesis 3a

Hypothesis 3a stated that there will be a positive association between paternal exercise and pre-adolescent girls' exercise behavior. Hypothesis 3 was tested by computing Pearson Product-Moment correlation coefficient between paternal exercise score and girls' exercise score. The Pearson Product-Moment correlation for the relationship between paternal moderate exercise and girls' exercise was $r = .06, p = .51$; the correlation between paternal vigorous exercise and girls' exercise was $r = .10, p = .26$. Based on these findings, hypothesis 3a was not supported.

Hypothesis 3b

Hypothesis 3b stated that there will be a positive association between maternal exercise and pre-adolescent girls' exercise behavior. Hypothesis 3 was tested by computing Pearson Product-Moment correlation coefficient between maternal exercise score and girls' exercise score. The Pearson Product-Moment correlation for the relationship between maternal moderate exercise and girls' exercise was $r = -.07, p = .42$; the correlation between maternal vigorous exercise and girls' exercise was $r = .08, p = .34$. Based on these findings, hypothesis 3b was not supported.

Research Question 1

Research question 1 asked what relationship exists between perceived social competence and girls' exercise. Research question 1 was explored by computing Pearson Product-Moment correlation coefficient between the perceived social competence sub-scale score and the girls'
exercise score. The Pearson Product-Moment correlation for perceived social competence and girls’ exercise was \( r = .22, p = .007 \). This finding showed a statistically significant positive relationship between girls’ perceptions of social competence and their exercise behaviors.

**Research Question 2**

Research question 2 asked whether paternal exercise or maternal exercise correlates more strongly with girls’ exercise. Research question 2 was explored by examining the Pearson Product-Moment correlations between paternal exercise and girls’ exercise scores and between maternal exercise scores and girls’ exercise scores. The correlation coefficients for paternal moderate and vigorous exercise and girls’ exercise were \( r = .06 \) and \( .10, p = .51 \) and \( .26 \) respectively. For maternal moderate and vigorous exercise and girls’ exercise, the correlation coefficients were \( r = -.07 \) and \( .08, p = .42 \) and \( .34 \) respectively. The correlation coefficients between paternal exercise and girls’ exercise and between maternal exercise and girls’ exercise were small and statistically non-significant, indicating that neither paternal nor maternal exercise can be expected to explain variance in girls’ exercise.

**Additional Findings**

**Individual parental behaviors and girls’ exercise.** Due to the small number of cases in each parental behavior group, it was decided to evaluate the relationships between girls’ exercise and the individual maternal and paternal behaviors. Pearson Product-Moment correlations between each separate paternal and maternal behavior (acceptance, psychological autonomy-granting, direction-supervision) and girls’ exercise were computed. The only statistically significant findings were negative correlations for both maternal and paternal psychological autonomy-granting and girls’ average exercise intensity (see Table 17).
Table 17.

**Individual Parental Behaviors and Girls' Exercise**

<table>
<thead>
<tr>
<th>Parental behaviors</th>
<th>Girls' average exercise intensity</th>
<th>$r$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers</td>
<td>Acceptance</td>
<td>.08</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>Psychological autonomy-granting</td>
<td>-.17*</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Direction-supervision</td>
<td>-.02</td>
<td>.83</td>
</tr>
<tr>
<td>Fathers</td>
<td>Acceptance</td>
<td>.07</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>Psychological autonomy-granting</td>
<td>-.23**</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>Direction-supervision</td>
<td>.07</td>
<td>.37</td>
</tr>
</tbody>
</table>

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Chapter V

Discussion of the Findings

The purpose of this study was to examine the relationships between the independent variables of perceived competence, perceived parental behaviors, and parental exercise and the dependent variable of pre-adolescent girls' exercise behavior. This chapter interprets the findings of the data analysis in light of the theories and past empirical studies from which the hypotheses and research questions were derived.

Girls' Exercise and Perceptions of Competence

Hypothesis 1 and its four sub-hypotheses stated that there is a positive relationship between perceived competence and exercise behavior of pre-adolescent girls. This hypothesis is derived from sport socialization theory and competence motivation theory. Kenyon and McPherson (1973) proposed that greater competence in exercise leads to greater participation in exercise. Competence motivation theory proposed that multiple competence perceptions exist for children and that the four types of competence perceptions are related to children's behaviors (Harter, 1978).

Hypothesis 1a proposed a positive correlation between girls' exercise and girls' perceptions of athletic competence. Previous empirical studies found that perceived athletic competence was positively related to children's exercise and that children who participated in sports had higher perceived athletic competence than non-participants (Ferguson et al., 1989; Roberts et al., 1981; Snyder & Spreitzer, 1976). In this study, girls' perceived athletic competence was positively and significantly correlated with girls' self-reported average exercise intensity. This finding is consistent with theory and previous research.

Hypothesis 1b stated that girls' perceived cognitive competence is positively correlated with girls' exercise behavior. In one previous empirical study, Roberts and colleagues (1981)
found that pre-adolescent boy and girl sports participants had higher perceived cognitive competence than non-participants. In the present study, pre-adolescent girls' perceived cognitive competence was positively but non-significantly correlated with girls' reported average exercise intensity, so Hypothesis 1b was not supported. Findings in the present study did not support the theory suggesting that perceived cognitive competence is related to girls' reported average exercise intensity. The absence of a significant correlation between perceived cognitive competence (an intellectual ability) and exercise (a physical ability) in the present study may mean that the relationship does not exist for girls alone. The results from this study suggest that cognitive competence perception does not generalize to other areas of ability for girls.

Hypothesis 1c stated that girls' perceived global self-worth is positively related to girls' exercise behavior. In previous research, Roberts and colleagues (1981) found that perceived global self-worth was significantly higher for a group of pre-adolescent boy and girl sports participants than for a non-participant group. However, in the present study girls' perceived global self-worth was positively but non-significantly correlated with girls' reported average exercise intensity, so Hypothesis 1c was not supported. Findings in this study did not support the theory suggesting that perceived global self-worth is related to girls' reported average exercise intensity. The relationship between perceived global self-worth (liking and being happy with oneself) and exercise (a physical behavior) may not exist for girls alone. This study's results suggest that, for girls, global self-worth perceptions do not generalize to other areas of competence.

Hypothesis 1d stated that a set of perceived competence variables that included perceived athletic competence, perceived cognitive competence, and perceived global self-worth would explain more of the variance in girls' exercise behavior than those perceived competence variables taken alone. Some previous empirical studies (Brustad, 1993; Ferguson et al., 1989;
Snyder & Spreitzer, 1976) included only one type of competence perception, athletic competence. One previous empirical study (Roberts et al., 1981) did include four types of competence perceptions but did not examine the ability of a combination of competence perceptions to explain differences in sports participation for a sample of both boys and girls. In this sample of girls, multiple regression analysis revealed that perceived athletic competence alone explained 8% of the variance in girls' exercise intensity, and Hypothesis 1d was not supported. Although they were low to moderate, intercorrelations between the various competence perceptions indicate that the perceived competence variables share some of the variance on girls' exercise, limiting the ability of the set of perceived competence variables to explain variance in the exercise behavior of girls. Regression analysis did not support the theory that a combination of competence perceptions would be more influential for girls' exercise than individual competence perceptions.

The results of this study using a sample of girls alone suggest that inclusion of boys and girls in past studies may have obscured gender differences. This study’s findings also suggest that it is behavior-specific competence perception that has more impact on the performance of a given behavior. This study extends knowledge regarding perceived competence and exercise in girls.

**Girls' Exercise and Perceived Parental Behavior Patterns**

Hypothesis 2 and its two sub-hypotheses are derived from sport socialization theory (Kenyon & McPherson, 1973). Parents who are permissive do not exercise high degrees of control over their children but are warm and nurturing; sport socialization theory suggested that their children are the most physically active. Authoritative parents are warm and nurturing like permissive parents, but exercise more direct control over their children’s behavior, so sport socialization theory proposed that their children participate less in exercise than the children of
permissive parents. Authoritarian parents are not warm and nurturing and are highly controlling of their children’s behavior, so sport socialization theory suggested that children of authoritarian parents would exercise the least (Kenyon & McPherson, 1973).

Hypothesis 2a stated that girls who report a permissive paternal behavior pattern will report more vigorous exercise than those who report authoritative or authoritarian paternal behavior patterns, and that girls who report an authoritative paternal behavior pattern will report more exercise than those who report an authoritarian paternal behavior pattern. Previous empirical research showed a significant relationship between parental influence and children’s exercise (Butcher, 1983; Greendorfer & Lewko, 1978). The earlier studies did not examine specific parental behavior patterns. For the present study, an attempt was made to identify specifically the paternal behavior pattern which influences girls’ exercise by using parental socialization behavior patterns from the literature on child development and sport socialization (Baumrind, 1966, 1971; Kenyon & McPherson, 1973; Schaefer, 1959, 1961, 1965b). This study found no significant differences in girls’ self-reported exercise intensity among the three paternal behavior pattern groups, and Hypothesis 2a was not supported. The findings of the present study did not support the theory suggesting that there are differences in girls’ reported average exercise intensity when paternal behavior patterns vary.

A review of the means for girls’ exercise intensity in the permissive, authoritative, and authoritarian paternal behavior pattern groups revealed that girls who reported paternal authoritarian behavior pattern had the highest mean exercise intensity. This is contrary to the proposed paternal effect on exercise in the sport socialization theory, suggesting that the model may not hold for fathers’ effect on girls’ exercise. The absence of statistically significant exercise differences among the girls in the paternal behavior groups does not provide support for proposing modifications in the sport socialization theory, however.
The lack of significant differences in girls’ exercise among paternal behavior groups may have been due to the small group sizes. If important differences do exist, larger groups for each paternal behavior pattern would be needed to reveal variation in girls’ exercise. Less than one-half of the fathers in this study could be classified into one of the three proposed paternal behavior patterns. In earlier research, Baumrind (1971) was able to place 68.5% of 254 parents into either permissive, authoritative, or authoritarian groups. In contrast, the 155 fathers in the present sample were spread across eight behavior patterns, with 85 fathers (55%) falling into five categories not included as variables in this study. The finding that significant numbers of fathers exhibited other parental behavior patterns may indicate that the sport socialization theory is incomplete when it stipulates only three paternal behavior patterns.

Hypothesis 2b stated that girls who report a permissive maternal behavior pattern will report more exercise than those who report authoritative or authoritarian maternal behavior patterns, and that girls who report an authoritative maternal behavior pattern will report more exercise than those who report an authoritarian maternal behavior pattern. As noted above, previous empirical research showing a significant relationship between parental influence and children’s exercise (Butcher, 1983; Greendorfer & Lewko, 1978) did not use specific parental behavior patterns as their variables. The present study using three maternal behavior patterns derived from the literature on child development found no significant differences in girls’ self-reported exercise intensity among the three maternal groups, so Hypothesis 2b was not supported. The results of the present study did not support the theory suggesting that there are differences in girls’ reported average exercise intensity when maternal behavior patterns vary.

A review of the means for girls’ exercise intensity in the permissive, authoritative, and authoritarian maternal behavior pattern groups revealed that the highest mean exercise was for girls reporting a permissive maternal behavior pattern, followed very closely by the mean
exercise score for girls reporting an authoritative maternal behavior pattern. The lowest mean exercise score was for girls reporting an authoritarian maternal behavior pattern. This trend is consistent with the sport socialization theory; however, the statistically non-significant differences among the groups do not provide support for the propositions of the sport socialization theory.

The lack of significant differences in girls’ exercise among maternal behavior groups may have been due to the small group sizes. As with fathers, less than one-half of the mothers could be classified into one of the three proposed maternal behavior patterns. The 155 mothers in the present sample were spread across eight behavior patterns, with 87 mothers (56%) falling into five categories not included as variables in this study. The finding that significant numbers of mothers exhibited other patterns of maternal behavior may indicate that the sport socialization theory is incomplete in stipulating only three maternal behavior patterns.

Girls’ Exercise and Parental Exercise

Hypothesis 3 and its two sub-hypotheses are derived from the sport socialization theory of Kenyon and McPherson (1973) and from social learning theory (Bandura, 1977, 1997). The sport socialization theory, drawing on social learning theory, accounts for socialization into physical activity roles through imitation of the behavior of significant others (Kenyon & McPherson, 1973).

Hypotheses 3a stated that there is a positive relationship between paternal exercise and girls’ exercise. Previous empirical research using samples of both boys and girls as well as older and younger children found significant relationships between fathers’ exercise and children’s exercise (Freedson & Evenson, 1991; Sallis, Patterson, Buono, et al., 1988). Neither paternal vigorous nor moderate exercise was significantly correlated with girls’ average exercise intensity in the present study.
In the sample obtained for this study, neither the girls nor their fathers engaged in much vigorous exercise. Girls' mean exercise intensity of 13.37 fell into the moderate activity range. For the activity to have been vigorous, the energy expended would have been 21.4 kilocalories per kilogram over the average 107 minutes of activity reported by the girls. The distribution of scores for girls' exercise was approximately normal, with a skewness statistic of .79, and fathers' moderate exercise scores were also approximately normal (skewness = .12). However, fathers reported little vigorous activity and the distribution of fathers' vigorous exercise scores was markedly skewed (skewness = 1.67) and demonstrated little variability. A possible explanation for the lack of correlation between the girls' exercise scores and the fathers' vigorous activity scores could be the non-normal distribution of the fathers' scores (Moore & McCabe, 1993).

The absence of support for Hypothesis 3a may also be explained by the use of fathers' self-report of exercise. Fathers' exercise activities may need to be specifically known or directly observed by daughters to socialize the girls to exercise. Because there was no way of knowing the extent of the girls' awareness of their fathers' exercise based on the methods used in this study, it may be preferable to ascertain girls' awareness of paternal exercise directly rather than using parental self-report of exercise to test the sport socialization theory. The use of measures such as accelerometers and exercise diaries by the fathers would provide additional data about paternal exercise. Having both fathers and girls enrolled in a supervised exercise program which includes direct observation of the participants may also provide more accurate and complete information about similarities in family members' exercise.

Another possible explanation for the difference in findings in this study may lie in the samples used. In two previous studies which found a significant relationship between parental exercise and children's exercise, both boys and girls were included in the samples and were combined for data analysis (Freedson & Evenson, 1991; Sallis, Patterson, Buono et al., 1988).
Combining boys’ data and girls’ data may have obscured the lack of a relationship between paternal exercise and girls’ exercise.

Hypotheses 3b stated that there is a positive relationship between maternal exercise and girls’ exercise. Previous empirical research using samples of both boys and girls as well as older and younger children found significant relationships between mothers’ exercise and children’s exercise (Freedson & Evenson, 1991; Sallis, Patterson, Buono, et al., 1988; Stucky-Ropp & DiLorenzo, 1993). In this study, neither maternal vigorous nor moderate exercise had a statistically significant association with girls’ average exercise intensity.

As noted above, mean exercise intensity for the present sample of girls fell into the moderate activity range, and the distribution of scores for girls’ exercise was approximately normal. Mothers’ moderate exercise scores were also approximately normal (skewness = -.13); however, mothers reported little vigorous activity. The distribution of mothers’ vigorous exercise scores was markedly skewed (skewness = 1.92) and showed little variability. A possible explanation for the lack of correlation between the girls’ exercise scores and mothers’ vigorous activity scores could be the non-normal distribution of the mothers’ scores (Moore & McCabe, 1993).

The absence of support for Hypothesis 3b may be explained by the need for mothers’ exercise activities to be specifically known or directly observed by daughters in order for mothers’ exercise to socialize their daughters to exercise. Stucky-Ropp and DiLorenzo (1993) found that girls’ report of exercising with their mothers explained a small portion of the variance in girls’ self-reported exercise (1%), but maternal self-reported exercise was not related to girls’ exercise. Because there was no way of knowing the extent of the girls’ awareness of their mothers’ exercise based on the methods used in this study, it may be preferable to ascertain girls’ awareness of maternal exercise directly rather than using parental self-report of exercise to test
the sport socialization model. Measuring girls’ awareness of mothers’ exercise, using instruments such as accelerometers to measure activity, and having mothers and girls enrolled in a supervised exercise program would be alternatives to self-report of exercise that may provide additional useful data about mother and daughter exercise.

Another possible explanation for the contrast in findings from this study compared to earlier research may lie in the samples used. In two previous studies which found a significant relationship between maternal exercise and children’s exercise, both boys and girls were included in the samples and combined for data analysis (Freedson & Evenson, 1991; Sallis, Patterson, Buono et al., 1988). Combining boys’ data and girls’ data may have obscured the absence of a relationship between maternal exercise and girls’ exercise.

Girls’ Exercise and Perceived Social Competence

Research question 1 explored the relationship between perceived social competence and girls’ exercise. This question is derived from the sport socialization theory and competence motivation theory. Kenyon and McPherson (1973) proposed that greater competence in exercise leads to greater participation in exercise. Competence motivation theory proposed multiple competence perceptions for children, including perceived social competence, and suggested that competence perceptions are related to children’s behaviors (Harter, 1978). Findings in the present study are consistent with theory suggesting a relationship between perceived social competence and girls’ exercise, but contrast with previous research findings.

In one previous empirical study, Roberts and colleagues (1981) found that there was no difference in perceived social competence between pre-adolescent boy and girl sports participants and non-participants. In contrast, the present study found a statistically significant positive correlation between social competence perceptions and exercise for a sample of girls. In the Roberts et al. study, the scores of both boys and girls on perceived social competence were
combined for data analysis. This may have obscured the nature of the relationship between perceived social competence and exercise for girls.

**Paternal versus Maternal Influence on Girls' Exercise**

Research question 2 explored whether paternal exercise or maternal exercise correlates more strongly with girls' exercise. Kenyon and McPherson (1973) proposed that children would imitate fathers' exercise behavior more than mothers' exercise behavior because physical activity has been labeled as masculine. Greendorfer (1983) thought that girls would not imitate their fathers as much as they would imitate their parent of the same sex, their mothers.

Previous empirical research using samples of both boys and girls as well as older and younger children found significant relationships between both fathers' and mothers' exercise and children's exercise (Freedson & Evenson, 1991; Sallis, Patterson, Buono, et al., 1988). Stucky-Ropp and DiLorenzo (1993) found that maternal self-reported exercise was not related to girls' exercise, but they did not include fathers in that study. In the present study, the correlation coefficients between paternal exercise and girls' exercise and between maternal exercise and girls' exercise were both small and statistically non-significant, indicating no relationship between girls' exercise behaviors and the exercise behaviors of either fathers or mothers.

The marked skewness of the mothers' and fathers' vigorous activity scores may have contributed to the absence of a correlation between girls' exercise and fathers' exercise and between girls' exercise and mothers' exercise. The use of self-report measures of mothers' and fathers' exercise did not provide a measure of the girls' knowledge about their mothers' and fathers' exercise. The girls may not have been aware of the parents' exercise behavior and therefore parental modeling of exercise may not have occurred for the girls.

**Girls' Exercise and Individual Perceived Parental Behaviors**

Relative to additional findings, the finding of a negative association between parental
psychological autonomy-granting and girls' exercise is interesting in that the negative pole of this dimension of parent-child interactions is labeled psychological control and is characterized by parental possessiveness, protectiveness, intrusiveness, and reliance on guilt-inducing parental behaviors to shape the child's behavior (Droppelman & Schaefer, 1963). The direction of the correlation found in this study suggests that girls' exercise behavior is associated with parents' use of guilt-inducing intrusive behaviors rather than with parental behaviors that respect the child's autonomous choices.

The above finding was unexpected. In past research, increased parental control has been associated with less curious, exploratory, and imaginative behavior, less friendliness and cooperativeness with other children, less verbal ability, and decreased school performance of children. Achievement-oriented behaviors aimed at proving one's capabilities were also found to be decreased when parental control was higher (Baldwin, 1948; Baumrind, 1971; Baumrind & Black, 1967; Bronfenbrenner, 1961; Grolnick, Ryan, & Deci, 1991; Moore & Bulbulian, 1976; Roberts, 1986; Steinberg et al., 1992). Associations between children's exercise and parental acceptance and between children's exercise and parental control behaviors have not previously been studied, so the findings of the current study should be viewed with caution and explored in future research.

One possible explanation for this unexpected finding may be that the effects of parental behaviors may differ according to the type of child behavior the parents seek to shape. Increased parental control has been associated with increased child conformity to social norms and increased child submissiveness (Baldwin, 1948; Baumrind, 1971). Positive results from many healthy behaviors such as exercise may not be apparent in the near term but felt much later in life, and a greater degree of parental psychological control may be needed to effectively socialize children into behaviors for which the children do not expect a short term gain or pleasant feeling.
It is also possible that overall these parents were perceived by their daughters as relatively more autonomy-granting than controlling, since the mean and median scores were near the top quarter in the range of possible scores for psychological autonomy-granting. These ancillary findings should be viewed with caution because the correlations are small. However, they provide an important focus for further study.
Chapter VI

Summary, Conclusions, Implications, and Recommendations

Summary

This study examined the sport socialization theory in order to understand the influences of personal attributes and behaviors of significant others on one health behavior of pre-adolescent girls. Hypothesized relationships between the independent variables of (a) perceived competence, (b) perceived parental behaviors, and (c) parental exercise, and the dependent variable of (d) girls' exercise behavior were empirically tested.

According to the sport socialization theory, exercise is a learned social role for which the individual possesses relevant personal attributes, receives systematic feedback from significant others, and observes others in the role (Kenyon & McPherson, 1973). Perceived competence is a personal attribute that is organized by activity, will be greater in some areas than in others, and is theoretically related to exercise (Harter, 1978; Kenyon & McPherson, 1973; White, 1960, 1963). Theoretically, parents are the most important source of feedback regarding exercise before adolescence (Greendorfer, 1983; Kenyon & McPherson, 1973). Permissive parents are the most effective socializers of exercise behavior for their children compared to authoritative or authoritarian parents, and father is a more important parental influence for exercise than mother (Kenyon & McPherson, 1973). Parental participation in exercise is theoretically related to their children's participation in exercise due to the salience of the observed parental behavior (Bandura, 1977, 1997; Kenyon & McPherson, 1973). It has been proposed both that children imitate the behavior of their same-sex parent as they learn behaviors, and that fathers' exercise behavior is more salient because vigorous physical activity is viewed as a masculine activity (Greendorfer, 1983; Kenyon & McPherson, 1973).

The hypotheses for this study were developed from the above mentioned theories:
1. There is a positive relationship between perceived competence and exercise behavior of pre-adolescent girls.

1a. Perceived athletic competence is positively correlated with exercise behavior.

1b. Perceived cognitive competence is positively correlated with exercise behavior.

1c. Perceived global self-worth is positively correlated with exercise behavior.

1d. The set of variables including perceived athletic competence, perceived cognitive competence, and perceived global self-worth explains more of the variance in exercise behavior than the independent variables taken alone.

2. Exercise behavior of pre-adolescent girls differs according to parent behavior patterns.

2a. Girls who report permissive paternal behavior pattern report greater exercise than those who report authoritative or authoritarian paternal behavior patterns; girls who report authoritative paternal behavior pattern report greater exercise than those who report authoritarian paternal behavior pattern.

2b. Girls who report permissive maternal behavior pattern report greater exercise than those who report authoritative or authoritarian maternal behavior patterns; girls who report authoritative maternal behavior pattern report greater exercise than those who report authoritarian maternal behavior pattern.

3. There is a positive relationship between parental exercise and exercise of pre-adolescent girls.

3a. Paternal exercise is positively correlated with girls’ exercise behavior.

3b. Maternal exercise is positively correlated with girls’ exercise behavior.

In addition to the hypotheses, two research questions based on the theories were formulated:

1. What is the relationship between perceived social competence and exercise behavior?

2. Is paternal exercise or maternal exercise correlated more strongly with girls’ exercise?
The final sample consisted of 155 healthy fifth- and sixth-grade girls, recruited in regular schoolrooms in nine schools over five school districts in northeastern New Jersey over the course of one year, and their parents. Of the 155 girls in the final sample, 51% were fifth-graders and 49% were sixth-graders. The possibility that onset of menstruation affects girls' exercise was examined, although only 36 girls (24%) were reported to have already begun menstruating by sixth grade. The t test revealed no significant difference in average exercise intensity between pre-menarcheal and post-menarcheal girls [t(150) = 1.08, p = .28]. All the girls were reported by their parents to have no impediments to exercise. Family information from parents revealed that most of the parents were Caucasian (60.4%), that 88.9% were educated through high school or beyond (13.8 mean years of education), that most were engaged in professional, managerial or technical support occupations (63%), and that most were in good health (90.6%).

All of the girls completed The Self-Perception Profile for Children (SPPC) (Harter, 1985), The Children's Report of Parent Behavior Inventory (CRPBI) (Schaefer, 1965 a, b) for both mother and father, and The Child/Adolescent Activity Log (CAAL) (Garcia et al., 1997). The SPPC had a coefficient alpha of .81 for perceived athletic competence, .75 for perceived social competence, .81 for perceived cognitive competence, and .81 for perceived global self-worth in this sample. For mothers in this sample, the CRPBI had a coefficient alpha of .94 for acceptance, .87 for psychological autonomy-granting, and .74 for direction-supervision. For fathers in this sample, the CRPBI had a coefficient alpha of .95 for acceptance, .91 for psychological autonomy-granting, and .82 for direction-supervision.

Hypotheses 1a, 1b, 1c, 3a, and 3b were tested and research questions 1 and 2 were explored by computing Pearson Product-Moment correlation coefficients. Hypotheses 1a, 1b, and 1c stated that perceived athletic competence, perceived cognitive competence, and perceived global self-worth would be positively related to girls' exercise. Research question 1 asked what
the relationship is between perceived social competence and girls' exercise. Only girls' perceived athletic competence and perceived social competence were positively and significantly correlated with girls' average exercise intensity ($r = .27, p = .001$, and $r = .22, p = .007$ respectively). Hypotheses 3a and 3b stated that paternal and maternal exercise would be positively related to girls' exercise, and research question 2 asked whether paternal exercise or maternal exercise would influence girls' exercise more. Neither vigorous nor moderate exercise of either parent were correlated with girls' average exercise intensity in this study (paternal moderate exercise $r = .06, p = .51$, paternal vigorous exercise $r = .10, p = .26$; maternal moderate exercise $r = -.07, p = .42$, maternal vigorous exercise $r = .08, p = .34$). Thus hypotheses 1b, 1c, 3a, and 3b were not supported, but hypothesis 1a was supported. Perceived social competence was found to have a significant positive relationship to exercise, but neither paternal nor maternal exercise were found to affect girls' exercise.

Hypothesis 1d, which stated that the set of variables including perceived athletic competence, perceived cognitive competence, and perceived global self-worth explains more of the variance in exercise behavior than those independent variables taken alone, was tested by simultaneous multiple regression analysis. Perceived athletic competence alone explained 8% of the variance in girls' exercise intensity [$F(3, 151) = 4.33, p = .006$]. Hypothesis 1d was not supported.

Hypotheses 2a and 2b, which stated that exercise behavior of pre-adolescent girls differs according to paternal and maternal behavior patterns, were tested by separate analysis of variance for perceived paternal behavior patterns and for perceived maternal behavior patterns. There were no significant differences among the paternal behavior patterns and maternal behavior patterns for girls' exercise [$F(2, 67) = 1.75, p = .18$ and $F(2, 65) = .73, p = .49$ respectively]. Hypotheses 2a and 2b were not supported.
Parental behavior pattern variables were a composite of three parent-child social interaction behaviors: acceptance, psychological autonomy-granting, and direction-supervision. While girls' exercise did not vary significantly by parental behavior pattern, the possibility that one or more of these individual behaviors might influence girls' exercise was explored by computing Pearson Product-Moment correlation coefficients for maternal and paternal behaviors and girls' average exercise intensity. Most of the correlations were small and non-significant. Surprisingly however, there were significant, small, negative correlations between both maternal and paternal psychological autonomy-granting and girls' exercise ($r = -0.17, p = 0.03$ and $r = -0.23, p = 0.004$ respectively). This suggests that perceived parental psychological control is more likely than psychological autonomy-granting, acceptance or overt direction-supervision to effectively influence girls' exercise behavior.

In summary, perceived athletic competence was the most potent explanatory variable for girls' exercise in this study but explained only 8% of the variance in girls' exercise. There were no significant differences in girls' exercise intensity among three parental behavior patterns. but parental psychological autonomy-granting had a significant negative correlation with girls' exercise. Perceived social competence had a small significant association with girls' exercise, but parental exercise was not correlated with girls' exercise.

**Conclusions**

Most fifth- and sixth-grade girls and their parents do not exercise to levels assumed necessary for physical fitness, a striking but not unexpected finding of this study. Girls and parents exercised at moderate rather than vigorous levels of intensity. Regular vigorous physical activity enhances self-esteem, body image, mood states, insulin function, lean body composition, and positive serum lipid profiles in children and decreases mortality and morbidity for adults (Gutin et al., 1994; Purath et al., 1995; Suter & Hawes, 1993; Taylor & Baranowski, 1991; The
President's Council on Physical Fitness & Sports, 1997; U.S. Department of Health & Human Services, 1996). The levels of physical activity reported by the study participants put them at risk for less-than optimal health outcomes, now and in the future.

Perceived athletic competence and perceived social competence were positively and significantly correlated with girls' exercise intensity. These positive self-perceptions of girls affect their choices to be physically active, and participation in physical activity affects these self-perceptions in a positive way. However, in this study only perceived athletic competence explained a small, significant portion of the variance in girls' exercise intensity. Based on theory and empirical findings, perception of athletic competence offers a partial explanation of fifth- and sixth-grade girls' decision to exercise.

Perceived parental socialization behavior patterns did not significantly influence girls' exercise intensity, contrary to the propositions of Kenyon and McPherson (1973). The pattern of differences in girls' exercise followed the proposed direction for maternal behavior patterns, but for fathers' behavior patterns, the pattern of differences was contrary to the propositions of the sport socialization theory. The absence of support for the hypotheses may be due to the small group sizes or because the sport socialization theory is inadequate. The results of this study suggest that there is more variety in parental behavior patterns than proposed in the sport socialization theory. One or more of the alternative parental behavior patterns exhibited by parents in the current sample may influence girls' participation in exercise.

Parental exercise was not significantly related to girls' exercise. The absence of an association with girls' exercise may be due to the low levels of exercise reported and the lack of variability in exercise scores, to measurement error associated with the use of self-reports, or to the girls' lack of awareness of parents' exercise behavior. The current findings suggest that parental exercise is not a significant influence on the exercise of girls although boys' exercise
may be influenced by parental physical activity as suggested by theory and previous research. The contrast of this study's findings with previous research emphasizes the need to examine boys' and girls' exercise behavior separately.

Psychological autonomy-granting by fathers and by mothers was found to have a small but statistically significant negative correlation with girls' exercise. This unexpected finding suggests that the process of socialization for a health behavior such as exercise may be different from socialization into social and academic activities. Other researchers have found that warm, accepting, and autonomy-granting parents have more socially competent and academically successful children (Baumrind, 1971; Baumrind & Black, 1967; Bronfenbrenner, 1961; Grönnick et al., 1991; Moore & Bulbulian, 1976; Roberts, 1986; Steinberg et al., 1992). This study's findings suggest that efforts to get children to demonstrate healthy behaviors may require different parental behaviors than those needed to stimulate social and academic success.

Implications for Nursing

Regular physical activity contributes to health in childhood as well as later in life (Gutin et al., 1994; Purath et al., 1995; Sallis et al., 1993; Suter & Hawes, 1993; Taylor & Baranowski, 1991; The President's Council on Physical Fitness and Sports, 1997). The adults and girls in this study reported only moderate intensity exercise, lower than that believed necessary for optimal health benefits (Astrand & Rodahl, 1970; Karvonen, Kentala, & Mustala, 1957; Rowland, 1990; Sallis et al., 1985; Upton, Hagan, Rosentswieg, & Gettman, 1983). The increased health risks associated with low levels of regular vigorous physical activity demand that nurses give attention to improving the exercise behaviors of their clients.

This study adds to the knowledge about several factors believed related to the exercise behavior of girls: perceived competence, parental socialization behaviors, and parental exercise. Athletic competence perceptions explained eight per cent of the variance in exercise intensity in
this study, leaving 92% of the variability in girls' exercise unexplained. Assessing girls' feelings and perceptions related to exercising and giving positive feedback to girls about exercise efforts may be useful to enhance perceived athletic competence and thereby improve girls' exercise. Nurses may also find it helpful to advise parents to provide opportunities and approval for vigorous physical activity by their daughters in order to enhance girls' athletic self-perceptions. Other personal attributes proposed by the sport socialization theory to be relevant to exercise participation include knowledge, skills, enjoyment of activity, orientation toward achievement or performance, aspirations for sport success, and duration of involvement in sports. Nurses need to understand the relationships between and among these other attributes and perceived athletic competence and their roles in exercise participation.

The findings of this study suggest that, contrary to sport socialization theory, parents are not important socialization agents for girls' exercise through parental behavior pattern. The sport socialization theory proposes other significant socialization agents for children's exercise, including teachers, school counselors, sport coaches, peers, and siblings. Although health professionals are not identified as examples of significant others by Kenyon and McPherson (1973), their definition of significant others as persons who influence the attitudes and behaviors of others could be applied to nurses and other health professionals. Nurses may have direct influence on girls' exercise through specific interventions with girls, individually or in groups.

The low levels of self-reported parental exercise were not related to girls' exercise in this study. Nursing interventions to improve parental exercise behaviors would have important benefits for the parents' health although the findings of this study suggest that improving parental exercise may not be an effective means of improving girls' exercise. Direct modeling of exercise by parents may be an important strategy to improve girls' exercise. Nurses may find that it is effective to advise parents to make their daughters aware of parent exercise practices by means
such as calendar entries, or that parents actually exercise with their daughters.

Perceived social competence was found to be positively correlated with girls' exercise. The social interactions experienced during physical activity would appear to be important to maintaining a habit of exercise. When seeking to increase girls' exercise participation, nurses' attentiveness to the social interaction needs of girls may be useful. Group exercise sessions, family exercise activities, or team sports may be important opportunities for girls to develop the habit of regular vigorous physical activity.

Parental psychological autonomy-granting was found to have a negative correlation with girls' exercise. Nursing strategies to impact on girls' exercise may need to be directed at some parental use of psychological control behaviors and less parental autonomy-granting in regard to their daughters' exercise. Nurses should proceed with caution in this area, however, since the findings of this study were unexpected and the correlations were small.

The sport socialization theory also proposes that environmental influences such as societal and family values, sanctions, and norms; number, accessibility, and diversity of exercise opportunities; schools, churches, and other organizations for children; and the type of neighborhood affect exercise (Kenyon & McPherson, 1973). Nurses may be able to improve girls' exercise habits through advice to parents about making regular exercise a valued activity, and through advocacy with parents and in communities to improve opportunities for physical activity by girls.

Girls' exercise habits may change over the course of their physical, psychological, and cognitive development. Nurses should consider that effective exercise-promoting strategies may differ over time and may need to adapt their interventions to developmental changes.

Recommendations

The theoretical basis and empirical findings of this study point the direction for future
research. The recommendations for future study are as follows:

1. Design studies using correlation, multiple regression, and structural equation modeling to build theory regarding the relationships between girls’ exercise and other variables theoretically proposed to affect exercise behavior.

2. Design and conduct further studies using objective measures of exercise such as accelerometers, calorimeters, and direct observation as well as self-report to examine further the nature of any relationship between parental exercise and girls’ exercise.

3. Conduct future studies to confirm and extend the finding of a negative correlation between parental psychological autonomy-granting and girls’ exercise.

4. Design and conduct qualitative studies of parent-child interactions concerning girls’ exercise, in particular exploring the use of psychological control by parents to increase children’s exercise.

5. Conduct longitudinal studies to discover the developmental changes in exercise behavior of girls as well as in the factors that influence girls’ exercise over time, because it is clear that children change in many ways over childhood.

6. Carry out subsequent studies building on identified parental links to children’s exercise that will examine effective strategies for improving children’s exercise.
References


Appendix A

Family Information Form

Please indicate for each parent, the highest grade in school which the person has finished (eg., 12 if finished high school, 13 if finished 1 year of college, etc.), current occupation, and racial or ethnic background.

<table>
<thead>
<tr>
<th></th>
<th>Highest grade</th>
<th>Occupation</th>
<th>Race / Ethnicity</th>
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<tbody>
<tr>
<td>Mother</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Father</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

About your nine- to eleven-year-old daughter:

Is your daughter presently healthy?  YES ___  NO ___

Has your daughter’s doctor or nurse practitioner told her that she should not exercise or play sports or play active games that involve running or exertion?  YES ___  NO ___

Does your daughter have any condition which prevents her from exercising, sports, gym class, or playing active games that involve running or exertion?  YES ___  NO ___

Has your daughter begun menstruating (having monthly periods)?  YES ___  NO ___

About parent’s health:

Are mother and father presently healthy?  Mother: YES __  NO __  Father: YES __  NO __

Has your doctor or nurse practitioner told you not to exercise or play sports or active games that involve running or exertion?  Mother: YES __  NO __  Father: YES __  NO __

Do you have any condition which prevents you from exercising, or playing sports or active games that involve running or exertion?  Mother: YES __  NO __  Father: YES __  NO __
Appendix B

The project identified below, for which you requested review and approval by the Rutgers Institutional Review Board for the Protection of Human Subjects in Research, has now been reviewed and approved. This approval is based on the assumption that the material you submitted to the Office of Research and Sponsored Programs (ORSP) contain a complete and accurate description of all the ways in which human subjects are involved in your research.

This approval is given with the following conditions:

1. that you will conduct the research according to the plan and protocol you submitted.
2. that you will immediately inform the ORSP of any injuries to subjects that occur in the course of your research.
3. that you will immediately inform the ORSP of any problems that arise in the course of your research.
4. that you will immediately request approval from the IRB of any changes that you make in the protocol of the research.
5. that you will give each person who signs the consent document a copy of their document, if they are using such documents in your research.
6. that this approval is valid for only the dates listed below.
7. that you will retain all signed consent documents for at least three years after the termination of the research.

Please note that the IRB has the authority to observe, or have a third party observe, the consent process or the research itself.

Failure to comply with these conditions will result in the withdrawal of this approval.

The IRB's review of your project is now complete, and you may commence your research. Your approval is valid for 1 year from the date of this letter.

Name of Principal Investigator: Jane Smith
Address: 320 Upper Highland Lake Drive
Institutional Conditions: None

One month before the end of the period of approval, you will be sent a “Renewal for Continuing Review” form to complete and return to the Office of Research and Sponsored Programs.
NOTICE OF IRB REVIEW AND APPROVAL: Initial/Revised/Continuation:

The project identified below, for which you requested review and approval by the Rutgers Institutional Review Board for the Protection of Human Subjects in Research, has now been reviewed and approved. This approval is based on the assumption that the material you submitted to the Office of Research and Sponsored Programs (ORS) contains a complete and accurate description of all the ways in which human subjects are involved in your research. This approval is given with the following conditions:

1. That you will conduct the research according to the plan and protocol you submitted.
2. That you will immediately inform the ORS of any injuries to subjects that occur in the course of your research.
3. That you immediately report any problems that arise in the course of your research.
4. That you will immediately request approval from the IRB of any changes that you make to the protocol of the research.
5. That you will give each person who signs the consent document a copy of that document, if you are using such documents in your research.
6. That this approval is valid for only the dates listed below.
7. That you will retain all signed consent documents for at least three years after the conclusion of the research.

Please note that the IRB has the authority to observe, or have a third party observe, the human process of the research itself.

Failure to comply with these conditions will result in the withdrawal of this approval.

Name of Principal Investigator: [Name]
Address:

Additional Conditions:

Our review includes the following condition: [List conditions]

Date: [Date]

[Signature]

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Appendix C

Parental Information Letter

Jane Cerruti Dellert, MSN, RNCS, CPNP

Dear Parents of Fifth- and Sixth-grade Girls,

With the approval of your daughters’ school, I am conducting a research study as part of the requirements for a Doctor of Philosophy (Ph.D.) degree at Rutgers, the State University of New Jersey College of Nursing. As a pediatric nurse practitioner, I am particularly interested in health behaviors such as exercise. Children’s behavior in many areas is strongly influenced by parents and by children’s ideas about their abilities. This study will examine relationships between parents’ actions and girls’ ideas about themselves and girls’ exercise. The information that you and your daughter provide is critical to answering questions about girls’ exercise. Your participation will ensure the success of the research.

The results of this study will be used to help health care professionals such as nurse practitioners and physicians to promote physical activity of girls. Parents who agree to take part are asked to provide some information about the structure of the family and family members’ education, and to answer two questions about exercise. Girls who are willing to take part will answer some questions in class on one day and fill out a brief exercise report each day in school for one week. No one is asked to do any extra activities and there is no cost to you or your child. I am interested in your usual lifestyle, and there are no “right” or “best” answers to any of the questions.

Please read the enclosed consent form carefully. Then, sign two copies of the consent form and keep one copy for yourself. Fill out the Family Information Form. Check off the appropriate responses to the Parents’ Exercise Habits questions. Return one copy of the signed consent form, the Family Information Form, and the Parents’ Exercise Habits questions to me in the stamped, self-addressed envelope provided.

I know that families are very busy these days and I appreciate your taking the time to read the materials I have sent you. Thank you very much for your help.

Sincerely,

Jane Cerruti Dellert, MSN, RNCS, CPNP
Oral Presentation of Research Study to Fifth- and Sixth-Grade Girls:

My name is Jane Dellert. I am a pediatric nurse practitioner and a student at Rutgers University. I am doing a research study and your school has given me permission to ask you to help me with the study.

As a pediatric nurse practitioner, I am especially interested in children’s health behaviors such as exercise. I hope that this research study will give me more knowledge about girls’ exercise so that nurses can help girls who need to exercise.

If you agree to help me, you will spend one class period giving me your opinion about yourself and how your parents take care of you. Then, you will fill out a short report about your exercise every day in class for one week. You do not have to do anything extra. I am only interested in your usual activity. This study is not part of your regular class work. Your teacher will not see your opinions and no one can make you fail this.

You do not have to give me your opinions. It is entirely up to you to choose to help me with my research. No one will know if you do or do not participate. Your parents will get information from me about my research and will be asked to agree that your family be included. But you are still free to help me or not. If you start helping me and you change your mind about giving me your opinions, you can just stop at any time. Your teacher and your parents will not know if you give me your opinions and they will not see your opinions.

If you have any questions for me before, during or after the research study is finished, you can call me. My telephone number is on your copy of the consent form if you agree to do this study with me.
Appendix D

CONSENT FORM FOR A RESEARCH STUDY: Parents

Title: Parent behaviors, perceived competence, and exercise behaviors of girls in middle childhood.
Principal investigator: Jane Cerruti Dellert, MSN, RNCS, CPNP
Rutgers, the State University of New Jersey

I am asked to take part in a study about parents, girls, and exercise. I will read this paper and ask as many questions as I need to understand what taking part will involve. If I agree to take part, I will sign this consent and keep one copy for myself.

PURPOSE OF THE STUDY:

This study looks at parents' exercise, girls' exercise, and girls' ideas about their abilities and about how their parents care for them. This information may improve the ways that nurses and other health professionals encourage good exercise habits among children.

PROCEDURES:

If I agree, my daughter and I will be among approximately 150 families giving information for this study. Parents will need a few minutes at home to answer questions about their family, their daughter's health, and their exercise. Girls will answer questions about abilities and parents' care on one day in class. Girls will also report their exercise each day for one week in class.

RISKS AND BENEFITS:

My daughter and I are not at risk by taking part in this project. A possible benefit of participation in this study is increased interest in exercise and sports. I understand that my daughter's school has given permission for this project, but that it is not part of the school's regular curriculum. Participating or not participating will not affect my daughter's grades or class standing. There is no cost to my family or my daughter for taking part in this study. All materials and postage for this study will be provided free of charge.

CONFIDENTIALITY:

I understand that all information given as part of the study is confidential. The consent forms and family information are kept separately in a locked file that only Ms. Dellert can open. No one will be able to identify my responses or my daughter's responses in any written reports of the research.

VOLUNTARY PARTICIPATION:

I am free to agree that my daughter and I take part in this study or to refuse to take part. I may take my daughter and myself out of this study at any time. I understand that I may contact
Ms. Dellert by telephone at [redacted] by fax at [redacted] at any time. The cost of telephone call or fax will be reimbursed to me by Ms. Dellert if I ask. I understand that I can contact the Rutgers University Institutional Review Board (IRB) at [redacted] if I have any questions regarding my rights and my daughter’s rights as research subjects.

I have read this consent form. I agree that my daughter ______________________________ and I will take part in this study. I am aware that this is voluntary. I know that I may withdraw my consent for my daughter and myself to take part at any time. I understand that I should complete the family information form and the parent exercise questions, and sign two copies of this consent form. I understand that I should return the family information form, the parent exercise questions and one copy of this consent form to Ms. Dellert in the enclosed envelope.

_________________________________________  ______________________________
Parent’s signature                  Date

_________________________________________  ______________________________
Investigator: Jane C. Dellert, MSN, RNCS, CPNP                  Date
CONSENT FORM FOR A RESEARCH STUDY: Child

Title: Parent behaviors, perceived competence, and exercise behaviors of girls in middle childhood.
Principal investigator: Jane Cerruti Dellert, MSN, RNCS, CPNP
Rutgers, the State University of New Jersey

PURPOSE OF THE STUDY:

This study is about parents, girls, and exercise. Experts want to know how girls build strong exercise habits. You can share your ideas with Ms. Dellert so that nurses can learn how to help children to have good exercise habits.

PROCEDURES:

About 150 families are giving information for this study. If you agree, you will answer some questions today. The questions are about your abilities and how your parents care for you. On the next five days, you will report about the exercise you did the day before. There are no “right” or “best” answers to the questions, and no “right” or “best” exercise. The study is interested in your ideas and your usual exercise.

RISKS AND BENEFITS:

There is no risk for you as part of this study. Your interest in exercise and sports may increase after taking part. Your school has given permission for you to be in this study if you want to do it, but this is not part of your regular school work. You will not get a grade or a mark on your report card. You do not have to bring anything for the study. All the paper and pencils will be given to you by Ms. Dellert.

CONFIDENTIALITY:

No one but you and Ms. Dellert will know if you decide to answer questions for the study. This form will go to Ms. Dellert, not to your teacher. No one except Ms. Dellert will see your answers and your exercise reports. Ms. Dellert will not share those answers with anyone.

VOLUNTARY PARTICIPATION:

You are totally free to agree to take part in the study or to refuse to take part. You can stop taking part any time you wish by telling Ms. Dellert that you want to stop. If you have any questions or you want to talk to her, you can call Ms. Dellert at [redacted]. The cost of the telephone call will be returned to you by Ms. Dellert. You can contact the Rutgers University Institutional Review Board (IRB) at [redacted] if you have any questions regarding your rights as a research subject.

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I have read this form. I __________________________ agree to take part in this study. I know that this is my choice. I know that I can stop at any time. I understand that I should sign two copies of this consent form, keep one copy and give one copy to Ms. Dellert.

____________________________________________________  __________________________
Child’s signature                                      Date

____________________________________________________  __________________________
Investigator: Jane C. Dellert, MSN, RNCS, CPNP         Date
Vita

1945  Born December 12 in Paterson, New Jersey
1963  Graduated from DePaul Catholic High School, Wayne, New Jersey
1968  BSN, Seton Hall University, School of Nursing
1968-1971 Registered Nurse, Englewood Hospital, Englewood, New Jersey
1971-1972 Registered Nurse, St. Joseph’s Hospital, Paterson, New Jersey
1972-1974 Registered Nurse, Alexander Linn Hospital, Sussex, New Jersey
1974-1980 Nursing Supervisor and Staff Development Instructor, Alexander Linn/Wallkill Valley General Hospital, Sussex, New Jersey
1980-1982 Assistant Director, Patient Care Services and Quality Assurance Coordinator, Wallkill Valley General Hospital, Sussex, New Jersey
1982-1985 Director of Patient Care Services, Wallkill Valley General Hospital, Sussex, New Jersey
1985-1986 Registered Nurse, St. Clare’s Hospital, Denville, New Jersey
1986  MSN, Seton Hall University, College of Nursing
1987  PNP certification, ANCC and NCBPN/P
1986-2002 Pediatric Nurse Practitioner, Dr. Arthur Torre, Fairfield, New Jersey
1989-1993 Nursing Instructor, Clara Maass Medical Center School of Nursing, Belleville, New Jersey
1993  Nursing Instructor, Englewood Hospital School of Nursing, Englewood, New Jersey
1994-1998 Nursing Instructor, Fairleigh Dickinson University School of Nursing, Teaneck, New Jersey
1998-2002 Assistant Professor, Pediatric Nurse Practitioner Program, Seton Hall University College of Nursing
1994-2000 Pediatric Nurse Practitioner, St. Clare’s Hospital, Denville, New Jersey
2000-2002 Pediatric Nurse Practitioner, Sussex County Public Health Nursing
2002  Ph.D. in Nursing, Rutgers, the State University of New Jersey